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THE PREVENTION OF TUBERCULOSIS.

PASTEURIZATION DEMONSTRATION AT GLEN OROUA FACTORY.

[By C. J. Reakes, M.R.C.V.S., Director, Live-stock and Meat Division.]

The practical demonstration of the pasteurization of separated milk at the Glen Oroua Factory is now beginning to yield practical results. It will be remembered that last season the Department, with the cordial co-operation and assistance of the directors of the Glen Oroua Company, installed a pasteurizer in the factory, with a view of giving a practical proof of the practicability of the process, and the good results to be attained from it when properly carried out. It was found, however, that the boiler-power was insufficient to enable the pasteurizer to be effectively worked, and consequently the demonstration had to be abandoned for that season. During the winter the directors installed a large boiler, and from the commencement of the present season all the separated milk at the factory has been pasteurized.

The pasteurizer used is one of the ordinary cylindrical form, and in actual working 1,250 gallons per hour were dealt with. At the beginning some difficulty was experienced as a result of the heated milk frothing when discharged into the skim-milk tank. This has been overcome by affixing to the mouth of the pipe a simple and inexpensive fitting in the form of a 2 in. elbow with an adjustable spring-valve attached. As the skim-milk finds its way to the tank, the pressure opens the valve just sufficient to spray out the milk to the width of the tank, which successfully breaks down the froth.

For a period of a few weeks, during which warm weather with warm nights prevailed generally, a few of the suppliers complained of trouble arising as a result of the separated milk having to be taken from the factory while still at a high temperature. They found that when they reached home it was too hot to feed to their calves, and that when stored until the following morning it became soured, and consequently unsuitable for calf-feeding. Other suppliers who had a good water-supply at their farms and were able to cool the milk down quickly had no trouble to report. At the same time the difficulty experienced by the few who complained was a real one, though it vanished when cooler nights became the rule. It had been thought possible that complaints would also have arisen as a result of drivers of milk-carts being splashed by the hot milk when driving home; but nothing of this kind has come under notice.

With a view to insuring the demonstration being carried out with exactitude and effectiveness without unduly trespassing upon the time of the factory-manager and his assistants, a capable and experienced officer of the Live-stock Division (Mr. A. Cook, Assistant Inspector of Stock) was stationed at Glen Oroua, and placed in charge of the work. In addition to attending to the treatment of the separated milk at the factory, Mr. Cook also maintains a supervision over the suppliers' pigs fed upon the pasteurized material, in order that reliable data as to results may be obtained. All pigs fed partially or wholly upon the pasteurized milk are respectively marked with a special ear-mark, and through the cordial co-operation of their owners we have been notified of sales of these pigs, thus being enabled to obtain particulars as to their condition, as regards the existence of tubercular disease, when slaughtered.

Up to the time of writing five batches of pigs fed wholly upon the pasteurized milk have been slaughtered, with most satisfactory results, as will be realized by the following figures :—

PIGS FED WHOLLY ON PASTEURIZED MILK.

No. 1 batch : 10 inspected. None affected with tuberculosis.

No. 2 batch : 20 inspected. 1 affected with tuberculosis (slightly affected in one submaxillary gland only) ; 3 affected with other diseases than tuberculosis.

No. 3 batch : 21 inspected. 1 affected with tuberculosis. (See remarks following.)

No. 4 batch : 23 inspected. None affected with tuberculosis.

No. 5 batch : 15 inspected. None affected with tuberculosis.

The one pig found tubercular on the 28th January was a very bad case. In view of the uniformly good results otherwise obtained, special inquiries were made as to the conditions under which this animal had been reared

and fed, it being believed that it must have been exposed to infection from some other source. Mr. Cook, who made the inquiries, reports as follows. It will be seen from this report that there is an element of doubt as to whether this pig was wholly fed upon the pasteurized milk.

I interviewed the owner of the pig to-day, and he informed me that he had recently purchased his present farm, and bought the pigs from the previous owner of the place, but understood they had received no non-pasteurized skim-milk. He said there may have been a possibility of it receiving some before he purchased it. I also examined his breeding-cows and other pigs, and to all appearance they look healthy. The houses for same are in fairly good condition, and are built 2 ft. or more above the level of the ground. The only thing noticeable is a chance of the pigs gaining access to the drainage from them.

This brings the definite net results to two pigs only being found affected out of eighty-nine, and of these one was a doubtful case. The other animal, it will be noted, exhibited only a very slight trace of disease.

It must be admitted that the demonstration so far has proved conclusively that the process of pasteurization, properly carried out, is effective and reliable as a means of preventing the spread of tubercular disease through contaminated separated milk. This is emphasized by the fact that all other pigs from the same immediate neighbourhood which have been wholly or in part fed upon non-pasteurized separated milk have shown a very high percentage of tubercular animals. Four hundred and thirty-seven of such pigs have been slaughtered under inspection, and a careful record kept of the results.

The temperature attained in the pasteurizer has varied somewhat, occasionally for short periods in some days falling slightly below 176° Fahr., which temperature has been set as the minimum standard ; but as a general rule it has been kept at 176° or over.

Plants for pasteurizing separated milk or whey have also been installed by the owners of certain other factories. In some cases these appear to be working satisfactorily, raising the material to a sufficiently high temperature to insure the destruction of tubercle bacilli ; but they have not been in operation for a sufficient length of time to enable practical results to become evident. One point, however, is clear—namely, that pasteurization immensely improves the feeding-value of both separated milk and whey, both calves and pigs doing much better upon it than on the raw material, putting on condition more quickly, growing and developing well, and showing an almost total absence of the indications of indigestion accompanied by scouring which are so common among calves, especially when fed upon non-pasteurized material. As a matter of fact, pasteurization is worth carrying out for this reason alone, and it is an every-day exprience to hear dairy-farmers stating that they would not go back to the raw material under any circumstances, as they find that which is pasteurized is so much better for the young stock.

In certain factories it is to be regretted that pasteurizing plants have been installed which have proved inadequate for the purpose, in that they do not raise the separated milk or whey to a sufficiently high temperature. This is a matter for great regret, since it not only opens up an appreciable risk of a practice which is perfectly sound when properly carried out being brought into disrepute, but also means that time and money are expended to no purpose whatever. The sooner this fact is realized by those factories, the better for their suppliers, and for the dairy industry generally.

CROPS, PASTURES, AND STOCK.

THE harvest in the principal grain-growing districts has been nearly concluded without serious interruption, the rains being of short duration, and followed by drying weather. High winds and caterpillars have caused some loss in Canterbury, and many crops, especially of oats, have been very light; but on the whole the yields exceed anticipations, and the grain is of exceptionally fine quality. A huge proportion of the wheat has been threshed from the stook; but most of the oats not yet chaffed are being stacked for the purpose of being cut for chaff as required. Many farms in Canterbury and Otago are reported to have grown insufficient oats for their own needs during the next twelve months. The Southland crops are now being harvested; they vary greatly, and the yield all round will be below the average of recent seasons. Good crops of grass-seeds have been secured in the west coast districts of the North Island; but elsewhere the yields are very light—the Banks Peninsula cocksfoot crop being estimated at 25,000 to 30,000 sacks, as against an average of 70,000 sacks. (A return of estimated yields of corn and other crops will be found on page 108.)

Shearing in the later flocks has been a good deal interrupted by showers. The season's clip has been generally disappointing in growth and condition—effects of the dry winter and spring.

The North Island generally is still suffering from insufficient moisture, although there have been local heavy downpours. Pastures have dried off badly, reducing the milk-yield, and compelling a rush of stock to sale-yards and freezing-works. Turnips and rape are suffering both from drought and from blight, many crops being a total failure. Grass and bush fires have done much damage; but, at the same time, the conditions have been favourable for good burns on new clearings. Early and copious rains alone will avert a serious scarcity of autumn and winter feed. In the South Island generally there have been frequent showers, and the situation as regards feed is fairly satisfactory, though in most parts, Southland excepted, more moisture is needed to insure good autumn growth.

Dairy cattle are showing the effects of the dry weather, and an unsatisfactory close of the dairying season is feared. Lambs are being sent to the freezing-works in large numbers and of irregular quality; and the same is to be said in less degree regarding sheep. At the sheep markets and fairs which are now being held there is strong evidence of prevalence of dry weather in the low condition of much of the stock offered.

HOLSTEIN FRIESIAN CATTLE.

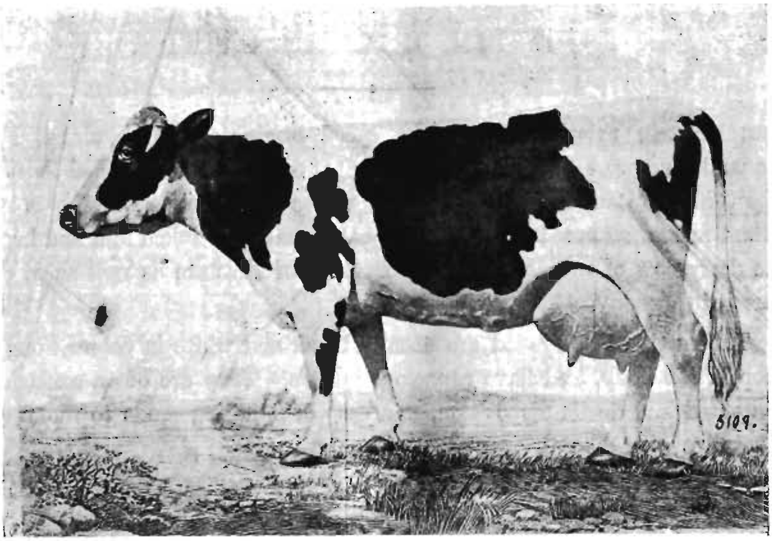
THE Holstein Friesian cattle as a breed originated in Friesland, North Holland, and were first kept by the people of the country, called Friesians. The term Holstein Friesian is the result of a compromise which was made to suit interested breeders, since these cattle had multiplied and had become the dairy cow of the neighbouring province of Holstein as well as of other parts of Germany.

The cattle of this breed are usually black and white in colour, long and deep in the body, and have capacious udders. They are of an exceedingly contented and docile disposition, and ease of handling tends to make them favourites with the dairymen.

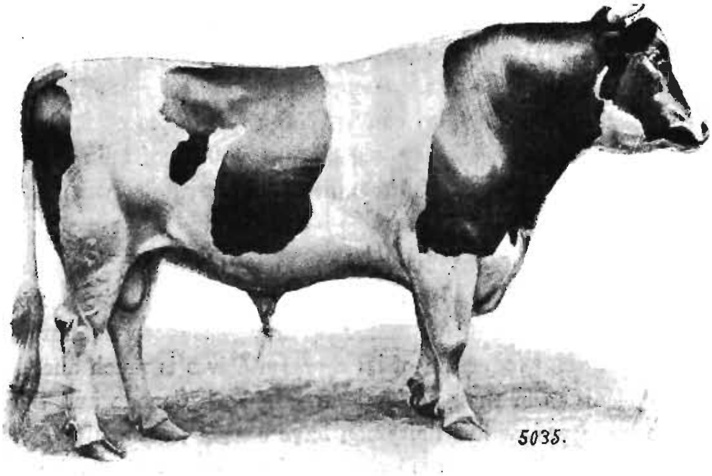
As a breed its representatives are widely scattered. In every dairy country they are to be found. They readily become accustomed to a changed environment, some representatives of this breed having been taken into northern Russia, where they climatized successfully within three and one-half degrees of the Arctic Circle. They are noted for their constitutional vigour. Their calves grow rapidly, and mature early.

Every breed has its limited adaptations, and in selecting a dairy breed the dairyman should be guided by a consideration of the class of land he owns. For good heavy land which grows roughage liberally, no breed of cow will probably equal the Holstein Friesians as milk-producers. For lighter land. or land of an exceedingly rough nature, some of the lighter breeds may give better results. The great capacity of cows of the Holstein Friesian breed enable them to convert large quantities of feed into milk, and trials have shown that they will produce 100 lb. of milk more cheaply than other breeds. This brings them into favour with dairymen who supply milk for local consumption.

Their good constitutions enable them to stand forcing remarkably well. In North America this breed, as well as the other dairy breeds represented in New Zealand—the Jerseys and Ayrshires—has been so nurtured and developed that the production of its representatives is much ahead of that of their progenitors in their native land. In both Canada and the United States the more progressive dairymen have ceased to worship the myth of the "dual purpose" cow, as is evidenced by their standards for advanced registry official records. The breeders of pure-bred dairy stock have gone in for testing the productive capacity of their cows, and this has shown the necessity for specialization.



COLANTHA 4TH'S JOHANNA.
Record : 998·26 lb. butter-fat in 365 days.



COLANTHA JOHANNA LAD, NO. 32481.
Dam : Colantha 4th's Johanna, No. 48577. Sire : Sarcastic Lad, No. 2397
Owned by D. W. Field, Dutchland Farms, Montello, Mass.

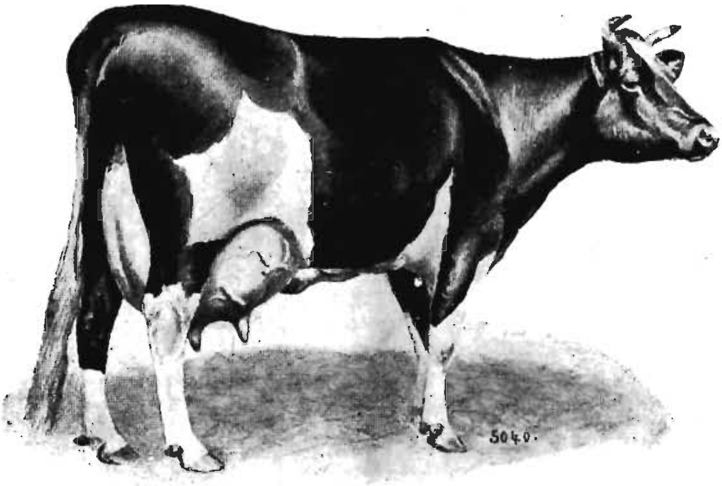
The milk of the Holstein Friesian cows has a reputation for a low fat-content. The environment responsible for the characteristics of this breed in its native land was conducive to a large quantity, but perhaps somewhat at the expense of quality. Born and reared in the low-lying districts of Holland, where grass was succulent and plentiful, these cows developed a large frame, and produced a large quantity of milk, but this was poorer in butter-fat than that of other dairy breeds. Breeders handling these cows outside their native land have endeavoured to increase the fat-percentage without decreasing the quantity of milk, and the tendency of recent years has been a development in this direction. Numbers of these cows will now give milk with an average fat-content for the year within the limits of 3·6 to over 4 per cent.

The popularity of this breed is extending in New Zealand, the relatively high proportion of casein to butter-fat in their milk making them specially adapted for cheesemaking, while their large yield of butter-fat makes them desirable for butter. There is also the advantage of a large quantity of skim-milk with a given amount of butter-fat.

There are Holsteins and Holsteins, and the best results are obtained only from those of special milking-strain. This position is not peculiar to any one breed, but applies to all the dairy breeds alike. Breeders of the black-and-white cattle have noted this, and have gone in for the testing of individual cows to an exceptional degree.

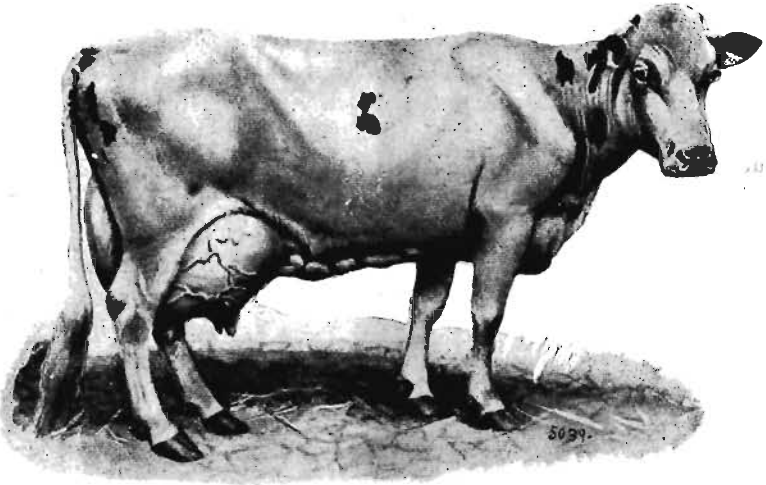
Several of the world's records are held by members of this breed. Colantha 4th's Johanna produced 998·26 lb. of butter-fat in 365 days. This is almost 1,000 lb. of butter-fat, and is probably equal to the production of almost five New Zealand average cows. To Dekol Queen La Polka 2nd belongs the honour of most milk for thirty days, this reaching 3,318·9 lb., while Grace Faynes 2nd Homestead produced a record with 28·44 lb. of butter-fat in seven days. It is contended by some that cows giving large yields for a short period cannot maintain a large production for a period of years. A number of breeders are now practising the yearly tests, and do not depend so much on the shorter-period tests, and this is doubtless the right principle. A Holstein cow which claims attention in this respect is Katy Gerben. Starting as a two-year-old, during five successive years she gave an annual average of 16,345 lb. milk, containing 543·48 lb. fat. This cow still holds the world's record for milk and butter-fat produced in one year by a three-year-old.

Illustrations of some of these cows of pronounced milking-strain are herewith produced. The bull Colantha Johanna Lad is a son of Colantha 4th's Johanna, referred to above, and changed owners at a price something over £1,600. Other illustrations are of cows contained in the herd of which he is now the head.



DE KOL CREAMELLE, No. 39158.

Official record (thirty days) : Milk, 3,200·3 lb. ; butter, 106·19 lb. Owned by D. W. Field, Dutchland Farms, Montello, Mass.

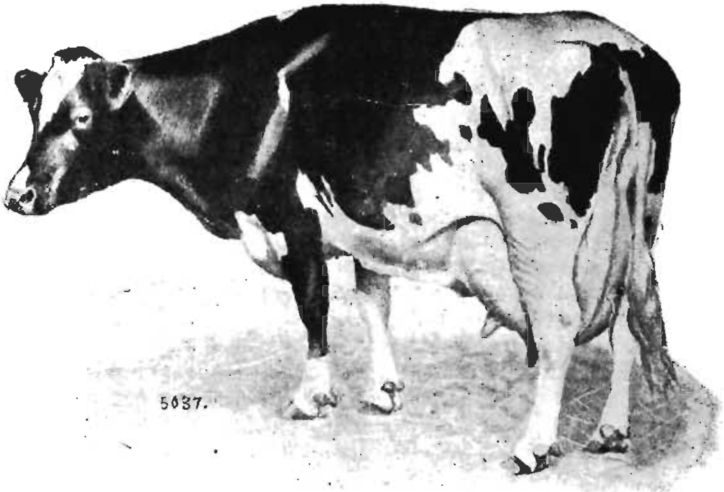


PONTIAC RAG APPLE, No. 56980.

Official record (thirty days) : Milk, 2,574·6 lb. ; per cent. butter-fat, 4 ; butter, 126·5 lb. Owned by D. W. Field, Dutchland Farms, Montello, Mass.

ROUBLE PECK PIETERTJE, No. 79752.

Official record (thirty days): *Milk*, 2,537·4 lb.; butter, 116·83 lb. Owned by D. W. Field, Dutchland Farms, Montello, Mass.



AGGIE CORNUCOPIA PAULINE, No. 48426.

Official record (thirty days): Milk, 2,640 lb.; per cent. butter-fat, 4 17.; butter, 137·60 lb. Owned by D. W. Field, Dutchland Farms, Montello, Mass.

ALMA COIN HENGERVELD DE KOL, No. 78769.
Official record (thirty days): Milk, 2,870 lb.; butter, 115·33 lb. Owner by D. W. Field, Dutchland Farms, Montello, Mass.

KAURI-GUM: WRONGFUL APPLICATION OF THE TERM TO NEW CALEDONIAN GUM.

AT the instance of the Minister of Agriculture and of Industries and Commerce the High Commissioner has made representations to the British Board of Trade with regard to the official use of the word "kauri" when describing gum produced in New Caledonia. It is pointed out to the Board that the word "kauri" is the Maori name of the tree, and is the name under which the New Zealand product is known on the markets of the world. It is understood that, though obtained from a tree of the same genus, the New Caledonia gum is different from and inferior to the New Zealand kauri-gum, which is peculiar to this country, there being no trees of the same species (*Agathis australis*) found in other countries. The application of the term "kauri" to this foreign gum is therefore likely to injure the New Zealand article, and it is desired that in British official publications the Dominion should have the exclusive right to the name "kauri." It is suggested that the other article could be designated "New Caledonian gum."

In acknowledging the receipt of the communication the Board of Trade (Commercial Department) states that a copy thereof has been forwarded to the Foreign Office, with the request that attention may be drawn in the proper quarter to the desirability of avoiding the use of such a description in future reports.

SILVER BLIGHT.

RECENT WOBURN EXPERIMENTS.

[By A. H. COCKAYNE, Biologist.]

IN the Twelfth Report of the Woburn Experimental Fruit-farm* is a very important paper on the cause of silver leaf, a disease which is said to be identical with the silver blight of New Zealand. As the results of the experiments conducted at Woburn are distinctly at variance with the general ideas prevalent in New Zealand regarding this disease, some account of the investigations will be valuable to New Zealand fruit-growers.

GENERAL DESCRIPTION OF THE DISEASE.

Silver blight has been long known to fruit-growers and gardeners in New Zealand. The foliage of affected trees becomes light and silvery in appearance, and diseased trees can be at once distinguished, even at a considerable distance, from healthy ones by the silvery sheen of the affected leaves. In certain cases only individual branches become affected during a season, the other portions of the trees remaining perfectly normal. In other cases the whole tree becomes affected, and no normal foliage may be present. During the winter on deciduous trees the presence of the disease cannot be detected when once the leaves have fallen, but on evergreens, such as the Portugal laurel (*Cerasus lusitanicus*), the silvered leaves are conspicuous during the whole of the year. Silvering of foliage is, however, not always to be attributed to silver blight. Thrip-attack will often produce a silvering of the upper surfaces of leaves, especially on rhododendrons and the giant laurustinus; but in the case of true silver blight the leaves attain their characteristic hue when no insects are present. In general, affected trees die after a certain lapse of time, but this may not occur for several years, and, while suffering, a considerable amount of growth may take place and a small quantity of fruit be produced. At times silvered trees appear to throw off the disease and become perfectly healthy again, but definite information on this point is scanty. It is, however, certain that affected trees do occasionally completely recover, even when no treatment is adopted.

When a diseased branch is cut there will generally be seen a discoloration of the wood, which seems to extend down the stem below the point of silvering. This discoloration may be merely a streak, but at times a considerable area of the wood from the bark to the pith may be affected.

* Twelfth Report of the Woburn Experimental Fruit-farm. By the Duke of Bedford and S. U. Pickering. 1910.

In peaches and plums this discoloration is not always present, but in all the cases of apples that I have examined the wood appears affected.

Nearly all members of the plum family seem to be liable to attack, together with certain other plants such as currants; but the main fruit-trees affected in New Zealand are peaches, plums, apricots, apples, nectarines, and occasionally pears. The Portugal laurel, which is badly attacked in England, frequently becomes attacked here, but appears to be able to live for a good many years after the trees become first affected.

SUGGESTED CAUSES.

For many years the cause of silver blight was a matter for much conjecture. It was but natural to think that the disease, whatever it might be, would first gain an entrance through the leaves. This idea held for many years, not because any definite causative organisms were ever discovered in the leaves, but, as the leaves were the only organs outwardly affected, it was thought they must naturally contain the organism causing their diseased appearance. In 1902 Professor Perceval* attributed the cause of silver blight to the activity of a fungus known as *Stereum purpureum*, in the wood of affected trees. The fruiting portions of this fungus develop on the bark of dead trees only, and are found on the dead wood of many trees that have never shown any signs of silver blight, such as horse-chestnut, sycamore, hornbeam, pines, willow, birch, and elm.† In England it also commonly fruits on the dead portions of trees affected with silver blight. In New Zealand, *Stereum* has been collected by me on apple-trees, plum-trees, and Portugal laurels that have died from silver blight, but I was under the impression that it had only gained an entrance after the trees had died. I have never noticed *Stereum* on the bark of affected peach or apricot trees; but, as badly attacked trees are generally cut down and burnt before they entirely die, this may account for the apparent scarcity of this fungus in orchards suffering from silver blight. Professor Perceval's conclusions have by no means been generally accepted, and the following extract from Massee's "Diseases of Cultivated Plants and Trees"‡ well sums up the views of his opponents :--

> This [silvered] appearance is due to the presence of air-cavities under the cuticle, formed by the more or less complete separation of the cells of the epidermis, due to the splitting-apart of the vertical walls. In other respects an affected leaf appears to be perfectly normal—there is no stunting, and the chlorophyll is present as usual. In some instances a single branch is attacked, which usually dies during the second season after showing the disease, the rest of the tree remaining perfectly healthy. This is more especially the case with trees grown under glass. When growing in the open the whole tree is not infrequently attacked, and then usually succumbs within two or three years—in some instances, however, lasting much longer.

* Jour. Linn. Soc., 35, 390. 1902.

† W. G. Smith. *British Basidiomycetes*. P. 405.

‡ Massee, G.: "Diseases of Cultivated Plants and Trees." 1910. P. 66.

Trees, when once attacked, as a rule do not recover. The disease appears to be much more prevalent at the present day than in past times, or perhaps it is more frequently noted now.

Professor Perceval claims to have proved that a fungus (*Stereum purpureum*) is the primary cause of the disease. This, however, I have not been able to confirm ; I have examined hundreds of diseased trees without finding a trace of the fungus, either on the surface or in the tissues.

Another view is that the injury is due to excess of nitrogenous matter* in the soil ; but the disease often breaks out on a large scale in places where no such excess of nitrogenous matter exists. Besides, this idea could not account for the disease attacking a single branch of a tree. I consider the effect to be the outcome of some physiological disturbance, resulting in the production of a ferment capable of dissolving the pectic substances present in the middle lamella, and thus allowing the cells to break away from each other.

THE WOBURN EXPERIMENTS.

Ever since 1904 the Woburn Experimental Fruit-farm has been experimenting on the cause of silver leaf, and the results are fully embodied in the Twelfth Annual Report of that institution. That they appear to fully confirm Perceval's contention that silver leaf is due to *Stereum purpureum* is shown by the following quotation.

Independently of his results, however, those described in the present report would be quite sufficient to place the matter beyond doubt ; for the inoculation of a tree with a piece of a fungus has nearly always been found to produce silver leaf, whilst neighbouring trees which were not thus inoculated remained quite healthy. Further, trees which have died partially or entirely after an attack of silver leaf so often develop the *Stereum* on the dead wood that it is impossible to avoid connecting the one with the other, especially as no single instance is on record of the appearance of the fungus on a tree which has been known to have shown no signs of silvering whilst alive.†

For the purpose of inoculation it is only necessary to insert a small portion of this fungus, about twice the size of a pin's head, in a cut made in the bark of the tree, binding up the cut so as to prevent the fungus from being washed out. Previous to use, the fungus should be kept in a warm, moist atmosphere, so as to insure its being in an active condition.

The first sign of infection consists of a gradual appearance of silvering of the leaves, which, when the tree is in active growth, may occur in a week or two after the inoculation, whilst the whole tree may become seriously affected within four or five weeks. In many cases it is noticeable that the infection seems to spread from the point of inoculation : if one branch only has been inoculated, that branch is the first to suffer, and if one side of the stem has been inoculated it is on that side that the silvering first appears.

The outward manifestation of disease is no doubt due to a poison formed during the growth of the fungal threads—probably this is so with all fungoid and bacterial diseases—for no evidence of the presence of the fungus itself —*i.e.*, its mycelium—can be found in the leaves. The silvery appearance

* In New Zealand certain nitrogenous manures have been recommended for the control of silver blight.

† This must refer to fruit-trees only, as the fungus regularly appears on the dead wood of many forest-trees that have never shown any signs of silver blight when alive.

of the leaves seems to be due to the cells composing them having become partially disconnected, owing to changes brought about in the nutrition of the plant.

Turning to the actual experiments on the subject: These were started early in 1906, when a plantation of 112 two-year-old trees was made, consisting of twenty-eight specimens each of Monarch, Czar, Rivers's Early Prolific, and Victoria. The trees were planted in rows of eight, two of each variety, at a distance of 4 ft. between each tree, except in certain cases, where, for special reasons, still closer planting was adopted; generally, each row was treated in some particular way, and formed a separate experiment.

Forty-eight of these trees were inoculated early in the year with *Stereum* obtained from a silver-leaved plum-tree, and, of these, thirty-nine, or 81 per cent., showed silvering before the end of July, four of them having been killed outright by that time, and two others being half-dead. Besides the dead trees, eight of the others were silvered as to the whole of their foliage, whilst in the remainder which suffered, the silvering was only partial.

In contrast with these results, it is found that not one of the sixty-four uninoculated trees showed any signs of silvering, and, it may be added, none of them, unless subsequently inoculated, has shown any signs of it during the succeeding years. These results are in themselves ample proof that the disease is a consequence of *Stereum purpureum*. But, beyond this, of the inoculated trees, nineteen died during the first two years after planting, and all of these developed *Stereum* on the dead wood, whilst none of the uninoculated trees died, or showed any signs of the fungus.

Many experiments were conducted on various portions of trees—stems, branches, and roots—with the result that stem-infection produced by far the largest amount of silvering. Different periods of the year were selected for the inoculating, to ascertain whether there was any correlation between the season and infection; but the results indicate that the date of innoculation has no material influence. This is an important point, and greatly increases the difficulty of control-methods. There were also many valuable experiments conducted to show the action of *Stereum* obtained from one variety of tree on other varieties, such as *Stereum* from plums used on apples, pears, laburnums, and laurels; the susceptibility of different varieties of plums; the effect of vigour on infection; and the reinoculation of recovered trees. The experiments are carefully tabulated to show at a glance the results of the inoculations.

All these experiments seem to conclusively show that silver blight is entirely due to the infection, through wounds or cut surfaces, of the spores of *Stereum purpureum*.

THE SPREAD OF THE DISEASE.

It has been generally accepted in New Zealand that silver blight can be communicated to healthy trees by pruning them with the same knife that has just previously been used on affected trees. Mr. T. W. Kirk states,* "It may be communicated from an affected to a healthy tree by

means of a knife," and in consequence makes the following recommendation: "Use two knives, the first for pruning until the sound wood is reached, and the second for cutting off a piece of sound wood; or else sterilize the knife before making the final cut." This point has been carefully investigated at Woburn, and the following statement appears in the report:—

Whether the infection can be carried from tree to tree in the ordinary operation of pruning is another matter of practical importance. It is evident, of course, that if the pruning-tool happens to get impregnated with the spores of the *Stereum* itself it will be liable to infect the next sound tree on which it is used; but is it possible to infect such a tree by a tool that has been used merely on a silvered tree with none of the fungus actively fructifying on it? To definitely investigate the matter, two rows of eight plum-trees each were taken; one of these rows was inoculated, and all the trees in it became infected. The other row was not inoculated. In pruning these trees, one cut was made on a silvered tree, and then one on its sound neighbour, the whole of the trees being pruned in this alternate manner; but not one of the sound trees became infected, although the process was continued for two seasons. These two rows of trees, also, were planted only 2 ft. apart, so that in many cases their branches were actually rubbing each other. That there is no power of communicating infection by anything present in the silvered leaves was shown by making a pulp of such leaves and inserting it into a wound in the stem of a sound tree. In four instances where it was tried no results whatever followed.

The above experiment appears to be fairly conclusive; but it must be remembered that the affected trees used were ones that had been artificially inoculated. I should like to see a similar experiment conducted where the affected trees were naturally silver-blighted. Root-pruning of affected and healthy trees with the same implement also gave negative results. Experiments were made to graft infected scions on to healthy stocks; but in no cases was a successful juncture formed, although the operations were tried in two successive seasons. The complementary experiment of grafting healthy scions on diseased stocks also proved a failure. That heavy pruning seems to increase the amount of silver blight in New Zealand has been noticed from time to time. If the *Stereum* theory is accepted, the argument would be that heavy pruning, in exposing many wounded surfaces, renders the trees more liable to infection by air-borne spores. This, however, is hardly feasible in orchards where affected branches are all cut out and destroyed before any fungus has fruited. In such cases the presence of any large number of *Stereum* spores would be unlikely.

The Use of Sulphate of Iron.

The digging-in of sulphate of iron round the roots of affected trees has been recommended in New Zealand for many years, and amounts up to 12 lb. per tree have been used. The effect of this material has been carefully investigated at Woburn. Two sets of experiments were conducted, one on trees already suffering from silver blight, the other on healthy trees that were inoculated with *Stereum*, and which had an application of iron-

sulphate directly afterwards. The amount of material used varied from ¼ lb. to 1 lb. per square yard. The results were quite unsatisfactory, and no good effects were demonstrated, either in reducing the disease on the already silvered trees or in stopping the infection of the healthy ones. The experiments are summed up thus: "Treating the ground with iron-sulphate must therefore be regarded as being without avail."

Treatment.

The only treatment that is suggested in the Woburn report is the drastic one of uprooting and burning any affected trees, so as to stop the formation of any of the fructifications of *Stereum*. In the case of trees that are slightly affected, cutting of the branches below the point of silvering is suggested, and the success that has attended this practice in New Zealand is quoted. No sterilization of the pruning-knife is recommended, except in cases where dead wood that is liable to be carrying spores of *Stereum* is being cut out. In such cases the tool should be disinfected by dipping it in kerosene or a solution of carbolic acid.

In New Zealand the cutting-out of affected branches is largely practised, but the new wood frequently develops silver blight, and it cannot be said that this method has been at all successful in controlling the disease.

Of late years the view has been spreading that the application of certain materials to the soil gives good results. Iron-sulphate has been largely recommended, but according to the Woburn experience is useless. The use of sulphate of ammonia applied in varying quantities, from 2 lb. to 10 lb. per tree, dug in round the roots of affected trees, has recently been said to be effective, but definite experiments under this head are lacking. This remedy is distinctly at variance with one of the European theories,* that the use of nitrogenous manures increases the virulency of silver-blight attack. Dusting the leaves with lime has also been tried by many growers; but the results have not been successful enough to warrant its use.

Summary of Woburn Results.

The Woburn experiments seem to have demonstrated, so far as England is concerned, the following points:

1. The disease is caused by infection of the tree with the spores of *Stereum purpureum*, the spores gaining an entrance through wounds and cuts on the stems and branches.
2. The spores of *Stereum* are likely to infect trees at any period of the year.
3. The disease is not spread from tree to tree by pruning living affected and healthy trees with the same knife.
4. The use of sulphate of iron at the rate of 1 lb. per square yard has no effect in controlling silver blight.

* Massee, *loc. cit.*

THE NEED FOR DEFINITE EXPERIMENTS.

From the above it would appear that silver blight is undoubtedly due to infection of the living tree by the spores of *Stereum purpureum*. I must, however, confess that I have great difficulty in accepting such to be the case in New Zealand. The Woburn experiments conducted by Spencer Pickering, an able and careful investigator, must, however, be accepted rather than opinions based on supposition alone, and until disproved by careful and accurate experiments they must hold good. As silvering is said to take place within a few weeks of the actual inoculation, it should be a simple matter to prove conclusively whether *Stereum* is the real cause of silver blight in New Zealand. When once the ætiology of the disease is thoroughly established there is some hope of remedial measures being formulated. At present the experiments that have been conducted for its control in New Zealand have been largely guesswork, and as such are not likely to lead to any satisfactory result.

Specimens of *Stereum purpureum* from silver-blighted trees are necessary before any definite experiments can be taken in hand. Can any readers of the *Journal* furnish me with this material? *Stereum* from affected peach and apricot trees is particularly required. The fungus itself forms flat, roundish discs on the bark of the trees often two or three inches in diameter, and is generally of a purplish or pink colour, except when grown on the shady side of the tree, when it may be almost pure white.

ENSILAGE-STACK, SHOWING METHOD OF WEIGHTING.

THE WEATHER AND AGRICULTURE.

[By D. C. BATES, Director of Meteorological Office.]

JANUARY.

RAINFALL FOR JANUARY, 1911.

Departure from Normal for the Month, + above, – below.	Station.	Total Fall.	Number of Days Rain fell.	Maximum Fall, and Date.
	North Island.			
In.		In.		In.
– 0·19	Pakaraka	3·72	6	1·72 on 28th.
– 1·32	Auckland	1·25	8	0·41 „ 2nd.
– 5·21	Waiuku	0·76	7	0·28 „ 9th.
– 2·85	Waihi	2·62	9	1·00 „ 3rd.
– 3·59	Hamilton	0·71	8	0·30 „ 2nd.
– 1·67	Gisborne	1·04	6	0·46 „ 3rd.
– 0·50	Meeanee	1·20	6	0·50 „ 26th.
– 1·31	New Plymouth	2·64	9	0·70 „ 26th.
– 2·67	Inglewood (Taranaki) ..	4·82	10	1·18 „ 26th.
– 1·53	Wanganui .. .	1·42	5	0·48 „ 10th.
– 1·21	Levin	1·92	10	0·76 „ 2nd.
– 0·39	Wellington	2·99	8	1·30 „ 13th.
	South Island.			
– 1·95	Nelson	0·94	9	0·45 on 8th.
+ 4·30	Hokitika	14·08	7	3·60 „ 1st.
+ 7·42	Okuru	15·28	7	4·62 „ 1st.
+ 0·49	Lincoln	2·48	12	1·52 „ 12th.
– 0·13	Kapunatiki	1·80	8	1·10 „ 12th.
+ 1·17	Oamaru	3·20	5	1·08 „ 12th.
– 0·26	Balclutha	2·14	8	0·88 „ 13th.
– 0·80	Dipton	2·18	6	0·90 „ 12th.
– 0·75	Invercargill	3·37	16	0·46 „ 20th.

THE weather during the month of January was on the whole warm and somewhat dry. The "days with rain" were everywhere less than usual, and the rainfall was below the average except on the west coast of the South Island and a few other parts visited with heavy local downpours.

The storms were not of great intensity or magnitude, cyclonic disturbances from the tropics not having visited the country for a longer period than usual, and westerly low pressures this season also showing a tendency to diminish. The latter, chiefly affecting the South Island, passed on the 2nd and 8th. A remarkable change took place, with a high barometer, on the 12th, when

heavy rain fell about Cook Strait, while the barometric pressure decreased slightly in adjacent parts. A cold snap followed, and snow was experienced on some of the higher lands. A storm of a squally character occurred in the southernmost districts on the night of the 19th, for which the barometer fell and rose again very rapidly. Between the 26th and 31st there was a steady fall and rise of the barometer over the whole of the Dominion, with gloomy and changeable weather, heavy rain and strong winds in parts.

High and persistent westerly winds prevailed in Southland during the greater part of the month.

DISTRICT NOTES.

Auckland.—A fine dry January, the rainfall consisting of showers only, falling on eight days, the total amount considerably under the average of the previous forty-four years. Mean temperature slightly under the average. —(*T. F. Cheeseman.*)

Waihi.—January has been a very dry, fine month. The temperatures, while being lower than those of last January, were about the average. The velocity of the wind is below the average for January. On two days the sun was obscured (presumably from bush fires)—viz., on the 19th and 20th and this circumstance has tended to lower an otherwise very high average of sunshine.—(*H. B. Devereux.*)

Kohukohu.—After a dry month the creeks were flooded. The district had begun to fail, and water for household purposes was becoming scarce, when the rain on the 28th freshened the pastures and temporarily gave a sufficient supply of water.—(*A. C. Yarborough.*)

Waiuku, Auckland.—Grass drying up very much. Milk-supply falling fast. Most satisfactory harvesting month.—(*J. E. Makgill.*)

Kawhia.—A very dry and warm month; smallest rainfall for some years. Wind very often calm in the morning, but about 10 to 10.30 a strong sea-breeze comes up, and usually lasts till sundown.—(*J. K. Newton.*)

Rotorua.—An exceedingly dry month in Rotorua. Rain badly wanted. —(*J. F. Robieson.*)

Kaitieke (Raurimu).—The month of January has been very dry up to within a few days of the end; then there was a welcome downpour. Fair dews started about the middle of the month, somewhat counteracting the want of rain.—(*H. C. Wedde.*)

New Plymouth.—A fine summer month, with little rain. A heavy hail-storm, with thunder and lightning, on the night of the 27th. The south-east winds during the month have been very cold.—(W. N. Fletcher.)

Hiwi, Taihape.—A warm month, with a good deal of smoke about from bush fires. Nearly all the rain (2·125 in.) fell in heavy showers, mostly from thunderstorms which usually fell only over small areas, with the result that in some parts of the district the grass has dried off a good deal, while in other parts it is still green and plentiful.—(*A. R. Fannin.*)

Waituna West (Feilding).—January has been hot and dry, the rainfall being the lowest since February, 1909. Feed and water are getting very

short, particularly the water. Most of the settlers are anxiously looking for rain, many for their stock, and some few on account of their domestic supply. The dry weather has had its advantages too—lamb-shearing and haymaking were got through without any trouble, and now the harvest is well on the way. Farther up country the settlers have taken advantage of it to burn their bush, and so far a great part of the month the air has been more or less thick with smoke. Now, however, rain is badly wanted—not a little of it, but a real steady soaking. Two foggy mornings were noted.—(*J. Guylee.*)

Waitatapia (Bull's).—Very dry, hot month, a strong drying wind after each rainfall doing away with any benefit that the rain might otherwise have done. Good harvesting weather, but bad for rape, aphis showing on many fields.—(*K. W. Dalrymple.*)

Pahautanui.—The weather during the month has been seasonable, with fairly normal temperature ; rain slightly under that of same month of last year. It may be noted that on the 12th there was heavy rain with strong winds for a few hours, but from what I glean it was very local. Beyond an earth-tremor on the 9th, no unusual phenomena occurred. Feed is fast drying, and more rain is now needed.—(*J. Pearce.*)

Pine Grove (Dannevirke).—Very dry month. Very little rain has fallen here since July, 1910. This is the driest year, in my opinion, for over twenty years.—(*J. E. Riddel.*)

Motueka.—On the 26th the weather was fine and clear until 3.30 p.m., when a thunderstorm came over from the south-west, with hail and heavy rain till about 7.30 p.m., 0·95 in. falling in that time. The storm was apparently local.—(*G. S. Huffam.*)

Stanley Brook (Nelson).—A favourable season and a bountiful harvest. There is one drawback, however, for swarms of caterpillars have attacked the standing corn, causing the grain to drop off from the ear although the stalk was quite green. We have had some seasonable rains, and the cereals are early this season, in many instances the corn being sown and reaped in the same year—an unusual occurrence. Hops are said to be later, owing to the lack of soaking rains.—(*A. W. Fugle.*)

Karamea (Westport).—The heavy rains at the beginning of the month caused a luxuriant growth on pasture lands. The latter half has been dry, with strong southerly and south-westerly winds, and the settlers have taken advantage of these to get good burns on their clearings. As the grass is still green, there is no danger of the fires spreading, and a bush fire in virgin bush here is unknown.—(*E. J. Gilmor.*)

Lynton Downs (Kaikoura).—Latter end of month unfavourable for harvesting operations. On the 26th 1·89 in. of rain fell from 9 a.m. to 5 p.m.—(*T. Harrison.*)

Hanmer Springs.—Bright sunshiny weather ; very seasonable. All crops in district have now been harvested, and the yield on the whole has been very satisfactory.—(*S. J. Collett.*)

Christchurch.—A fine month, with rainfall slightly under the average for the month.—(*H. F. Skey.*)

Gladbrook Station (Middlemarch).—On the 7th and 20th we had high

has been relieved by the copious rains of the 8th and 12th, which have brought away the grain crops, and assured the turnips as well. Up to that time the grain crops were almost failures, but the dull days since have given the growing crops the full benefit of the rain, and in consequence the crops have appreciated fully 50 per cent. in the case of turnips, and 25 per cent. in the white crops. More rain is now required for the turnips to keep them strong and away from the blight.—(*A. McKinnon.*)

Methven (Canterbury).—Very cold rain, with snow on the tops, which, coming during the shearing season, caused a heavy mortality among newly shorn sheep.—(*J. Carr.*)

Pleasant Point.—Strong north-westers on the 20th and 21st did a good deal of damage to standing grain. The weather since then has been changeable and showery, and harvest operations are hindered considerably. Root crops and grass doing well.—(*J. Bishop.*)

Trotter's Creek (Hillgrove).—Harvesting is general in this district, with fair crops of both oats and wheat. Turnips are promising well, and also late-sown rape, but early rape has matured and is rapidly deteriorating. Stock on grass paddocks are now beginning to feel the pinch caused by the continued drought, as grass has now almost disappeared, and it is necessary to feed cows and horses. Blight has made its appearance in rape and other kinds of the turnip family. The heavy rainfalls of the 12th and 25th instant both came from the south-south-east, accompanied by a high barometer.—(*W. S. D. Trotter.*)

Bushey Park (Palmerston South).—A good month, with frequent showers. Harvest is now well advanced, and the threshing-mills are at work again, crops turning out in most cases better than at one time seemed possible.—(*Mrs. J. J. McKenzie.*)

Gore.—A very windy and dull month. Winds nearly always south-west.—(*Captain A. A. Scott.*)

Riverton.—The weather for the month has been most varied, but has been mostly characterized by high winds from the west and south-west. The occasional rain has done an immense amount of good, crops of all descriptions benefiting. So far, potatoes are quite free of blight, which I think is greatly due to the boisterous weather.—(*J. Geary.*)

Whangamarino (Chatham Islands).—Up to the present month, February, we have had the driest summer I have known for years on the Island. In January we had only a little over half an inch of rain until the 31st, when we had a fine fall, just half an inch, which has done an immense amount of good. We have had a good deal of high northerly winds, which often end in shifting to south-west, with rain. This season the wind shifted round with merely a very slight shower—in most instances not sufficient to register. On the 20th and 21st January we had strong northerly winds, which must have been more than local, as they brought with them smoke from the bush fires in New Zealand. This was so marked that the sunlight had a peculiar murky appearance, such as would be caused by a smoky atmosphere. Occasionally the smell of burning wood is quite noticeable. Cereals on this Island are confined almost exclusively to oats, grown for chaff for feeding draught horses. A few crops of turnips are grown for winter feed for sheep, and these have been seriously affected by the extreme dryness of the season.—(*F. A. D. Cox.*)

NASAL BOT IN SHEEP.

[By C. J. REAKES, M.R.C.V.S., Director, Live-stock and Meat Division.]

MUCH totally uncalled-for alarm appears to exist among sheepowners in New Zealand regarding this parasitic trouble.

Last year serious mortality occurred among sheep in some parts of the North Island, especially on the east coast, as a result of a diseased condition primarily set up by dietetic causes, and outwardly manifested by an acute inflammatory condition of the skin of the head. In a large proportion of the fatal cases of this trouble which came under notice the sheep were found to be suffering from extensive fatty degeneration of the liver, which no doubt was an important factor in causing the mortality. In the beginning this mortality was wrongly ascribed by stockowners to the nasal bot, and it has been a matter of considerable trouble to disabuse them of this idea. I myself investigated one outbreak which was reported to me as being due to nasal bot. It was nothing of the kind; but was the condition described in our reports as facial eczema or facial dermatitis.

The bot-fly of the sheep deposits its eggs on the margin of the nostrils of the animal; from these the young larvæ hatch out, and find their way up the nostrils into the sinuses (open spaces) which are present in the skull, and which have a communication with the nostrils. Here the larvæ remain until they attain their full growth, when they let go their hold, and are usually sneezed out by the sheep. By far the great majority of the sheep harbouring these parasites show no indication of any discomfort whatever, though no doubt they experience a varying degree of temporary irritation, occasionally of a severe nature, at the time the newly hatched grubs are making their way up the nostrils, and also when the fully grown larvæ are coming away in the spring.

Up to the present time there has been no outbreak of mortality in New Zealand as a result of the nasal bot, though for many years past a large number of sheep have harboured the parasite. I have no knowledge, either, of any serious mortality having occurred from this cause in any other country, the only authentic information available being to the effect that only very occasional deaths occur: and I am of opinion that even in these there may have been other contributing causes. It is an every-day experience to find sound, healthy fat sheep slaughtered in the freezing-works harbouring these parasites, which obviously have done no harm to the sheep themselves, and certainly have not in any way affected the fitness of the flesh for human consumption.

NOTE.—Further information regarding nasal bot is given in No. 23 of the Department's "Leaflets for Farmers."

CLEAN SKIMMING IN RELATION TO CLEAN CHURNING.

EXPERIMENTS regarding this subject were carried out at the Ladelund Dairy School, Denmark, in 1908–9, under the supervision of Mr. E. Konradi. A report on the matter was published in the Danish dairy journal "Maelkeritedende," and has been translated by Mr. J. Pedersen, Dairy Instructor of this Department, as below:-

During the last ten years the construction of separators has been greatly improved, and consequently a much cleaner skimming is now obtained. But in the same period the fat-content of the buttermilk has increased considerably. Following are analyses of fat left in *skim-milk and buttermilk* from 1898 to 1909 :—

Year.	Skim-milk: Number of Samples.	Fat.	Buttermilk: Number of Samples.	Fat.
		Per Cent.		Per Cent.
1898	945	0·121	135	0·336
1905	1,845	0·110	520	0·410
1906	1,986	0·107	405	0·400
1907	1,777	0·101	534	0·451
1908	2,189	0·090	578	0·470
1909	2,220	0·085	1,006	0·480

This table shows that the average fat left in the skim-milk in 1905 was 0·110 per cent., but in the year 1909 it was only 0·085 per cent. But in the same period the fat left in the buttermilk has increased considerably. It has increased from 0·410 per cent. in 1905 to 0·480 per cent. in 1909.

A cleaner skimming simply means that some of the very minute fat-globules which hitherto were lost in the *skim-milk* are now extracted by the improved separators. But in the churning process it would be difficult for these fine fat-globules to strike each other, stick together, and thus be formed into butter, and many of them would be lost in the buttermilk. The question is, however, whether the increased fat gained by a cleaner skimming is left as fat in the buttermilk, or are we simply moving the fat from the skim-milk to the buttermilk ?

Following are the results from the experiments at the dairy school. A separator with three different regulators, which affected the clean skimming, was used :-

No. 1. 0·087 *per cent. fat in skim-milk.*
No. 2. 0·149 ,, ,,
No. 3. 0·227 ,, ,,

Churning of the ripened cream from the three skimmings gave the following results :—

Of 100 lb. of butter-fat in whole milk there were lost in the buttermilk,—

By No. 1 skimming, 2·57 lb.
,, No. 2 ,, 2·34 lb.
,, No. 3 ,, 2·24 lb.

This shows that the finer the skimming the greater the loss of fat in the buttermilk. But if we look at the fat left in the skim-milk we get the following results :—

Of 100 lb. of butter-fat in whole milk there were lost in skim-milk,—

By No. 1 skimming, 2·08 lb.
" No. 2 " 3·50 lb.
" No. 3 " 5·36 lb.

Or, the extra amount of fat left in the skim-milk with the different degrees of less clean skimming is far greater than the extra loss of fat in the buttermilk from the cream of the same separation.

The yield of butter by the three different skimmings would therefore be as follows :-

Of 100 lb. of butter-fat in whole milk there were retained in the butter,—

By No. 1 skimming, 95·35 lb. of butter-fat.
" No. 2 " 94·16 lb. "
" No. 3 " 92·40 lb. "

Experiments have also been carried out at the Alfa Laval factory, in Stockholm. Following are the results :—

Milk per Hour, in Kilos.	Per Cent. of Fat in Skim-mlk.	Per Cent. of Fat in Buttermilk.	Butter made. in Kilos.
100	0·092	0·558	1,792
200	0·147	0·472	1,768
300	0·223	0·433	1,731

These results would prove that the fat-content of the buttermilk increases by a cleaner skimming, but at the same time the cleaner skimming increases the yield of butter. But there would be a certain limit beyond which it would not pay to increase the clean skimming of separators, unless a cleaner churning could be obtained at the same time. However, this limit is not likely to be reached for some time yet.

The problem of the future appears to be in the direction of obtaining a better or cleaner churning process, or to prevent butter-fat which has been *produced at great expense being returned to the suppliers in the* buttermilk. The average fat left in the buttermilk is now 0·48 per cent., and if this could be reduced to 0·30 per cent. it would mean on the present production a gain of over 800,000 lb. of butter to the dairymen.

Following are some of the factors which influence the fat-content of the buttermilk :—

(1.) Richness of cream ;
(2.) Careful cooling of the cream after pasteurization ;
(3.) *Uniform ripening* ;
(4.) Construction of churn ;
(5.) Temperature of cream ;
(6.) Size of fat-globules.

In rich cream the spaces between the individual fat-globules are small, consequently, during the churning process, the fat-globules strike each other and unite more readily, and the butter comes in less time. There is also the risk that the minute fat-globules are not sufficiently worked up in the short time, but get entangled in the membrane slime and become enclosed in a liquid condition. It has been recommended as a safeguard against loss in churning to skim a heavy cream—about 6–8 per cent. This would

mean less buttermilk, consequently less fat will be lost in the buttermilk. Against this would be a higher fat-percentage in the buttermilk. The body and texture is also likely to suffer, and the danger of the butter containing too much moisture is increased.

An intense cooling of the cream soon after pasteurization tends to a more exhaustive churning. This result is not impaired when the cream is again raised to the churning-temperature. Professor O. Jensen found that by cooling the cream to 36°–38°, and holding it for twelve hours, then slowly heating it to churning-temperature, there was a gain of about 0·8 per cent. in the yield of butter. By an intense cooling the minute fat-globules are thoroughly crystallized, and are therefore not so readily lost in the churning process.

Uneven ripeness of the cream tends to a high fat-percentage in the buttermilk. The well-ripened cream will churn easier. In the less-ripened cream the fat-globules will not so readily unite. Churning cream too sweet will also increase the fat-content of the buttermilk.

The construction of the churn without doubt will have some influence on the fat-content. However, there appears to be very little difference with the different makes of churns now commonly used. The following analyses were taken during the year 1909–10 :—

Churn.	Samples taken.	Fat in Buttermilk.
		Per Cent.
Danish churn	102	0·409
Combined	261	0·454

The churning-temperature without doubt is the most important point: the crystallization of the fat-globules depends on the temperature. Other conditions being equal, it is safe to assume that the churning-temperature and the fat-percentage of the buttermilk stand in proportion to each other. A low temperature (within a certain limit) means a low percentage of fat in buttermilk, and *vice versa*. In the summer months, with a high churning-temperature, the fat-content of the butter-milk is high: in 1909–10 it was 0·511 per cent., against 0·410 per cent. for the winter months.

We have tried at the dairy school to separate the buttermilk. Six hundred pounds of buttermilk with a fat-content of 0·50 per cent. gave 1·10 lb. of butter. The butter contained only 68·5 per cent. of fat, and had 27 per cent. of moisture. It had a very tallowy flavour, poor body and texture, and was very white in appearance.

SHORTAGE IN HAWKE'S BAY WOOL-CLIP.

The Fields Supervisor for Hawke's Bay District reports,—

I find that there will be a considerable shortage of wool in Hawke's Bay. The winter and spring seasons were bad. The wool is light, and short in staple. The Mangawhare clip is thirty bales under last year's total, and every station is affected. It is estimated that the total shortage in Hawke's Bay will equal 15,000 bales, equalling in monetary value, say, about £170,000. Good rains have fallen everywhere, and the inland pastures

THE COW-TESTING ASSOCIATIONS.

PROGRESS NOTES.

[By W. M. SINGLETON, Assistant Director, Dairy-produce Division.]

THE four cow-testing associations established under the auspices of the Department have been running smoothly since the beginning of the dairying season. In all, the records of some 3,745 cows are being compiled. The members get a return which shows what each cow in his herd produces in a thirty-day period, and the return further shows what each cow has to her credit from the date of calving to the end of the period covered by the return.

The season has furnished, during the period under review, an abundance of feed in most of the districts where cow-testing work is being carried on, and good cows have produced well. Although some dairy farms are carrying rather much stock to enable the good cows to do their best work, a number of farmers, on the other hand, have found themselves with insufficient stock to keep the pastures in the best condition for producing milk. Grass has gone to seed, has become dry and fibrous, and when such is the case it is not sufficiently succulent to prove as palatable as it should be for dairy cows. Under such conditions cows must be of special-purpose dairy tendency to prevent their putting fat on their frame instead of milk in the bucket.

The range of variation in production is large, and not only does this apply to individual cows, but it applies to herd-averages for each period as well. For four periods totalling 120 days, the production of the best herd of these four associations is 4,645 lb. milk and 180·64 lb. fat. The average production of the poorest herd for the corresponding period is 2,621 lb. milk and 96·65 lb. fat. This is a wide variation, and indicates that poor cows are being kept, for even in the poor herds there are some fair cows which help the average, and would produce exceedingly well with better feed and care. The average cow of all four associations for 120 days produced 3,643 lb. milk and 132·38 lb. fat. In the first test,—

At Dalefield,	22 cows of best herd produced as much as 38 of worst herd.				
At Stratford,	20	"	"	41	"
At Cambridge,	25	"	"	42	"
At Kaupokonui,	21	"	"	45	"

Each successive test has confirmed such variations as these. It shows that in the poorest herds, speaking approximately, two cows are being fed and milked for the total butter-fat produced by one cow in the best herds. The gross return of the poorer cows is only one-half, but the net return will

ıuch less, as the total charges for two cows must be deducted from the ; returns in one case, whereas those of only one cow are to be deducted .e other case.

t will be admitted that the yields of the herds vary considerably, and ; is, of course, some grounds for expecting certain variations in this ect. Some of this variation is due to the variable percentage of heifers ıe herd. Some of it is also due to the pasturage. However, the condi- of the pastures as well as the quality of the cows reflects to a great ıt on the farmer who has been in charge of them for some time. A good may get possession of a farm which requires much improvement, and ı time results, as determined by the production of the cows, may not true criterion of his ability as a dairy-farmer. However, some farmers r such circumstances have, by devoting their attention to getting a ion of the farm in good condition, been able to make solid progress and ood work from an early date. Some of our best records for the average of the herd have come from such farms.

'he real difference between individual cows is not so well disclosed in -averages, where at times many circumstances must be taken into ideration, as it is when comparing the production of cows of approxi- ly the same age in the same herd which are getting the same kind of and attention. A few figures will illustrate what variations occur in a portion of the season. These will evidence wider variation at the of the lactation period.

erd No.	Age.	Days in Milk.	Milk.	Fat.	Value at 11d. per Pound.	Pounds Fat per Day.
	Years.		lb.	lb.	£ s. d.	
1	7	204	3,339	128·99	5 18 3	0·632
	7	143	4,846	207·57	9 10 3	1·45
2	11	115	4,255	169·66	7 15 6	1·48
	11	107	2,764	96·78	4 8 8	0·90
3	10	143	6,361	216·93	9 18 10	1·52
	11	147	3,634	141·00	6 9 3	0·96
4	10	140	5,730	230·67	10 11 5	1·65
	8	146	4,307	145·78	6 13 7	1·00
5	8	147	4,297	235·99	10 16 3	1·61
	9	148	3,202	120·39	5 10 4	0·81
6	4	142	4,463	158·03	7 4 10	1·11
	4	143	3,280	119·24	5 9 3	0·83

'igures such as these must appeal to dairymen. In the first herd it be noted that the owner milked one cow 204 days for milk of a money ; of only £5 18s. 3d., whereas another cow in the same herd was milked 143 days for milk valued at £9 10s. 3d.—sixty-one days, or 122 milk- less, and still more money to the extent of £3 12s. Further, the better has been milking only about one-half her total period. She will have ı more to her credit at the end of the season. Both cows are at an vhen they should be at their best, and both are in the same herd.

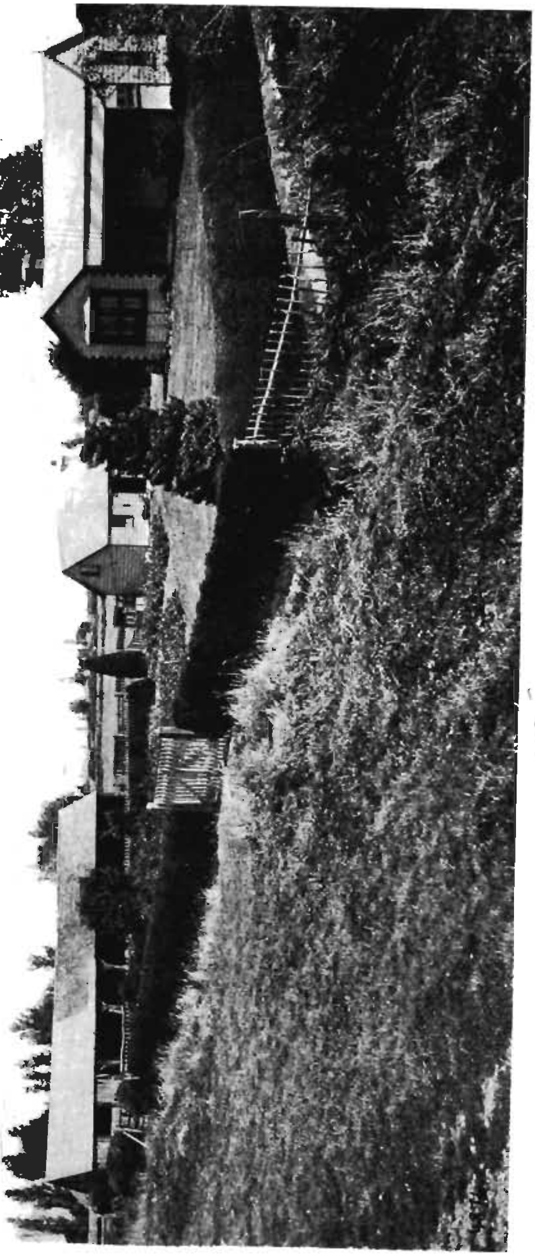
All these figures disclose wide variations, and many farmers have already culled out some of their cows which have proved themselves failures.

Members using the information relative to their herds can easily ascertain which cows should be culled out, and which should be the mothers of the heifers reared for the replenishing of the herds. The culling is easily accomplished by any novice who can understand figures; but the replenishing of the herd in such a way as to increase the average production each year is work which requires greater capacity on the part of the dairyman.

The herds of dairy cows at present producing milk might be made to do better work under present conditions. Pure-bred sires from good milking-strains are no doubt a necessity in raising the productive capacity of a herd to the highest level, but much can be done by good feeding and kindness, and regular milking-hours. The herds with the highest average are those in which the individual cows are quiet, having nothing to fear. We have not been among a herd of dairy cows with an average production amongst the highest of the associations in which the cows are not quiet, and without fear of those who milked or handled them. If the average dairy-farmer could be persuaded to feed his cows well and handle them quietly much better results would be obtained, and the dairyman would gain financially. When dairymen generally come to realize this, one of the fundamental points which underlie herd improvement will have been gained. Without it even the best-bred dairy cows will not be the success which may be expected.

PORK FOR THE BRITISH ARMY.

THE High Commissioner for New Zealand reports that it was recently decided by the Army Council that fresh pork might, at the discretion of commanding officers, be issued to the troops once a week during the winter months, instead of fresh beef, provided that no extra expense was incurred. The announcement specified that the pork must be subject to strict inspection and be confined to that bred in the United Kingdom. With a view to bringing the merits of New Zealand pork before the army authorities, the High Commissioner communicated with the War Office, pointing out the drastic inspection to which all carcases of pork were subjected before being shipped from the Dominion, and requesting that the possibility of including New Zealand pork in the supply to the troops might be favourably considered. A reply was received from the Army Council stating that it was not anticipated that commanding officers would avail themselves largely of the new regulation, and in any case the limited issue could not affect trade to any appreciable extent. They did not therefore then consider it advisable to depart from the condition that the pork must be home bred and killed. Should the consumption be found to be greater than anticipated, however, they would consider the desirability of extending the conditions to include imported pork of good quality.



Farm Homestead, Canterbury Plains.

POULTRY-KEEPING.

[By F. C. BROWN, Poultry Instructor.]

(*Continued.*)

LOCATION AND SOIL.

ONE of the most important questions to decide in establishing a poultry plant is location. This requires to be dry and well sheltered, and, if possible, within easy reach of a good market. It is not necessary that expensive land should be bought close to a large centre, in order that the owner may deliver his own produce. I have seen large losses made owing to the personal marketing interfering too much with the work of supervision. The best plan is to go a few miles inland, where land is cheap, and select a site close to the railway. Time and money will thus be saved, and the product can be railed to market, where care should be taken to secure a reliable agent.

I have frequent inquiries as to how many birds can be kept on a certain area of land. Much depends on the class of land. The best of all soils is a sandy loam, which dries up quickly. On free sandy loam, four hundred, even five hundred, fowls to the acre may be run without fear of disease. With this intense stocking, however, the grass will probably soon be scratched out, so that the whole of the green food may have to be grown separately. On damp, heavy land it is necessary that grass be grown, and the number of stock to the acre considerably reduced, otherwise the runs will be a puddle in winter. In the summer it will form a hard cake—one of the causes, by the way, of corns on the birds' feet. The sandy loam never becomes sloppy in winter, and in summer the birds can always find a free moist place to dust in.

The best remedy for tainted ground is to give the run a rest. A good sprinkling of lime on the run is good, as it not only sweetens the soil, but encourages plant-growth. Fowls are better on a moderate piece of clean ground than on double the area of tainted soil.

HOUSING AND ACCOMMODATION.

The housing question is of great importance, not only from the point of view of health and the best results in production, but in regard to re-

duced cost of construction and reduced allowance required for depreciation. There are many different styles of houses. The writer would recommend the lean-to style, which is effective, cheap, and can be built to any size to meet requirements, or opened up in front according to climatic conditions. All over the world more consideration is being given to fresh air in poultry-houses. The mistake in the past has been to overcoddle, and produce birds resembling hothouse plants. Netting is now taking the place of glass, and this in practically all climates. So long as the birds have ample fresh air, it is surprising the crowding they will stand without risk of injury. Experiments conducted by the Department go to show that so long as the birds are high and dry it is not necessary that they should be kept very warm at night, while the fresh-air treatment is far preferable from a health view-point when this can be obtained with freedom from draughts. Birds confined in close houses are usually poorly feathered, and consequently prone to the ill effects of extremes of temperature. Nature provides that birds are clothed according to their environment. The open, or partly open, house must be, however, absolutely draught-proof—that is, with no cracks in the back or side.

A scratching-shed is necessary if winter eggs are desired. The floor of this should be covered with litter, into which the grain food should be thrown.

Laying out a Plant.—In laying out the plant every care should be taken to obviate the necessity of opening doors and gates in order to attend to the birds, collect eggs, &c. Alley-ways from which the principal work can be done without the attendant leaving them should be the main feature in the arrangement. The division-fences of wire netting should have a plain wire, well strained at the top, centre, and bottom of the posts. Do not have a batten on top, or the birds will be encouraged to fly over. The netting should be sunk in a trench 3 in. to 4 in. deep, the end being dipped in tar before unrolling, and pegged down with long staples made of plain wire.

It is a mistake to plant trees that grow high in a fowl-run to provide shade. Not only do they obstruct the sun, but there is always a risk of the birds flying over the fences; moreover, the fowls are often induced to roost in them. Low shrubs or a small patch of Cape broom is all that is required.

Place the house facing the north-east, in order to admit as much of the sun's rays as possible. This is a provision that is too frequently overlooked. The highest side should face the rising sun.

Foundation and Floor.—In all locations the foundation or wall-plate of the house should be at least six to eight inches above the ground-level, and the inside filled up with well-rammed earth. This will aid in keeping

the house dry, a condition imperative for the best results. Dampness in a fowlhouse is the cause of many diseases.

The floor itself should be of earth. A wooden floor is under all circumstances objectionable. It not only is a good harbouring-place for vermin, but it is not so comfortable for the birds, and is certainly less sanitary than the earthen floor. It also encourages rats and mice. When there is not an abundance of sand to spread on the floor, earth should be well rammed, and covered with asphalt or tar and sand.

FIG. 1. SHOWING METHOD OF SUSPENDING THE PERCHES.

Perches.—The perches should be placed fairly low, so that the birds will not bruise their feet when flying. Eighteen inches from the floor is ample. Do not nail the perches, or they will be a harbour for vermin. They should be fixed by wires (see Fig. 1), or be fitted into a slot, so that they may be easily removed and the ends dipped into some strong disinfectant occasionally. A perch should be 2 in. wide by 3 in. deep, and made of sawn timber with the edges planed off. If there are any cracks these will harbour vermin.

Dropping-boards have their advantages, but their use is only advisable where they can be maintained in a thoroughly sanitary state, and are easily removable, so that thorough cleansing is an easy matter. The great drawback to their use is the medium they provide for the development of vermin,

and the unhealthy condition which can easily be brought about when they are not always maintained in a sanitary state, the birds being thereby forced to inhale the fumes of their manure.

Nests.—It is always best, when possible, to have nest-boxes placed outside and distinct from the houses, for the reason that nests are the best harbour of vermin on a poultry plant, and the more effectively vermin are kept out of the house the better it is for the poultry-keeper's pocket.

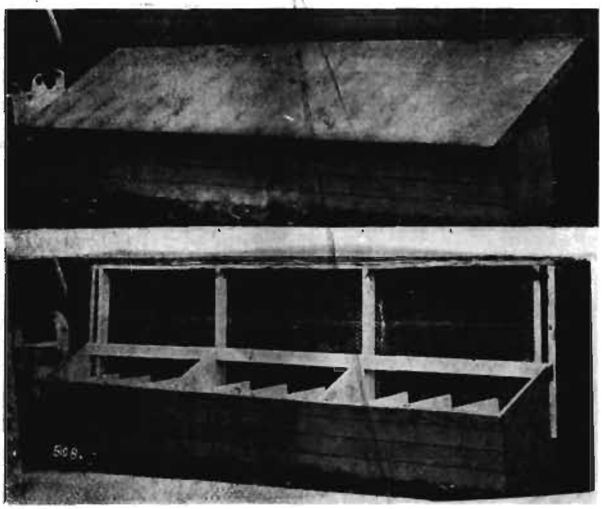


FIG. 2. OUTSIDE NESTS.

The upper figure shows the roof closed and the lower one raised.

The nests illustrated in Fig. 2 are made continuous and to any length required. The nest-boxes are 11 in. wide by 1 ft. deep, inside measurement. The height in front is 19 in., and at the back 13 in. The dividing-boards are of 1 in. timber, and the back boards of $\frac{3}{4}$ in. The roof is 2 ft. 6 in. wide, and is made in the shape of a frame, wire netting being stretched tightly over it, and this covered with flinkote. The roof is hinged to the top batten of the nest-boxes, so that it can be easily tipped when the eggs are being collected. The birds enter the nests from the alley-way between the nest-boxes and the house. This system of providing nests is strongly recommended. There is no wood on the bottom of the nests.

ILLUSTRATIONS OF FOWLHOUSES.

Fig. 3 comprises photos and plans of a cheap fowlhouse for a small plant, tested at the Milton station with satisfactory results. This house may be

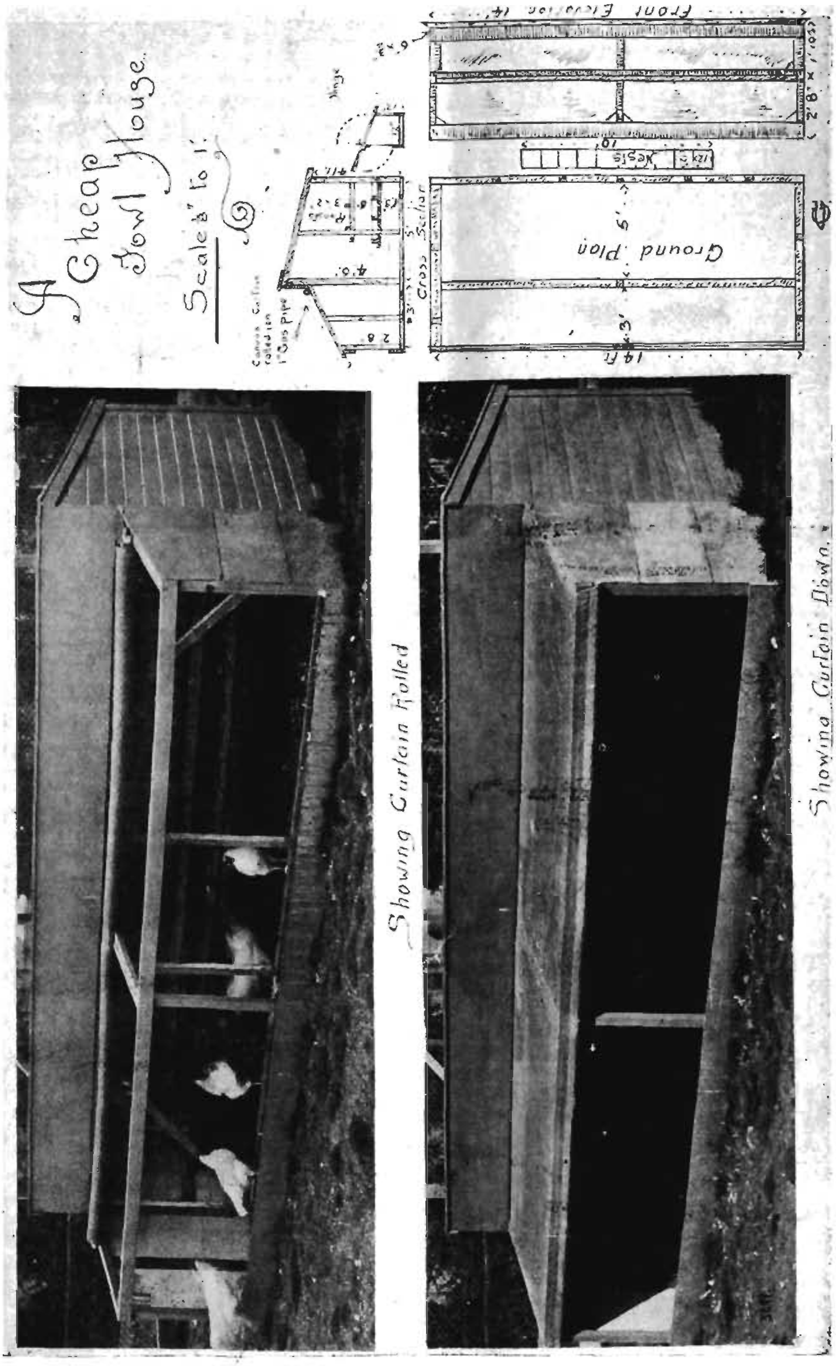


FIG. 3. CHEAP HOUSE FOR SMALL PLANT.

built any length to meet requirements, and can be recommended for those keeping a small number of fowls. The roof of the front portion is covered with oiled sail-canvas, and can be rolled up or down according to weather-conditions. The outer edge is folded and sewn so as to admit an inch gas-pipe. The weight of the pipe keeps the canvas taut, and prevents the wind from moving it. On the back part of the roof wire netting is stretched tightly, and is then covered with flinkote or other similar material. There are two perches, the back one being placed 12 in. from the wall, a space of 15 in. being allowed between the two. The wall-plates are 2 in. by 3 in., and the studs 2 in. by 2 in. Nests are provided as shown in Fig. 2.

Fig. 4 illustrates a double open-front house, as used at the Milton Poultry-station. For 100 hens this style can be built any size to meet requirements. Its length is 20 ft., the width 11 ft., the front 6 ft. 6 in. high, and the back 5 ft. It is divided into two by wire netting, boarded 3 ft. high from the bottom. The front is covered with 1 in. wire netting, and the outside, up to 3 ft. from the bottom, is covered with flinkote roofing. A doorway is provided at each end, 2 ft. 6 in. wide. There are three perches, of the sort already described, as shown in Fig. 1. The perches are 18 in. from the ground, 12 in. from the back wall, and 15 in. from centre to centre of perches; the ends are 3 in. below the quartering from which they are suspended. Above the scantling, to which the flinkote is nailed, is a hinged shutter, which can be raised during stormy weather, as shown. The wall-plate should be at least seven or eight inches above the ground-level, and the floor filled with clay well rammed, tarred, and sanded. The object of this house is to provide fresh air, combined with freedom from draughts, which is the keynote to keeping fowls in a healthy condition.

Fig. 5 represents a useful winter house at the Burnham Poultry-station. It is mainly used for growing stock. During the coming winter it is to be divided into four compartments with wire netting to accommodate eighty birds. The birds are confined the whole year round, being supplied in the house with the whole of the material they require. The dimensions are—length 30 ft., width 11 ft. 6 in., front 7 ft. 6 in., back 6 ft.; but the building can also be constructed any size to meet requirements. The maximum number in each compartment should, however, not be more than twenty. The whole of the feeding, watering, and supplying of grit can be done from the outside. The floor is covered with litter: straw, hay, pine-needles, &c., will do for this. The grain is fed in the litter. With the constant turning over, any moisture soon dries up, and there is no objectionable smell. It is quite sufficient to renew the litter three times a year. This system of keeping fowls is strongly recommended to city poultry-keepers, or those who have a limited area of land.

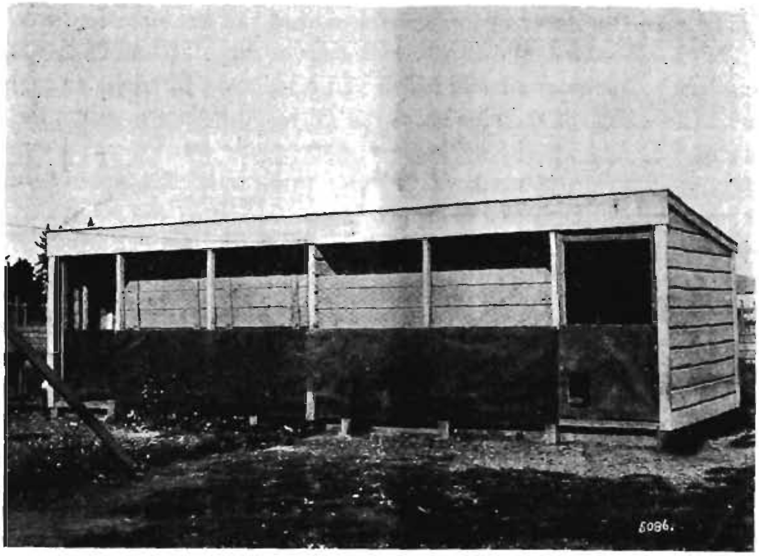


FIG. 4. DOUBLE OPEN-FRONT HOUSE, SHOWING SHUTTER RAISED.

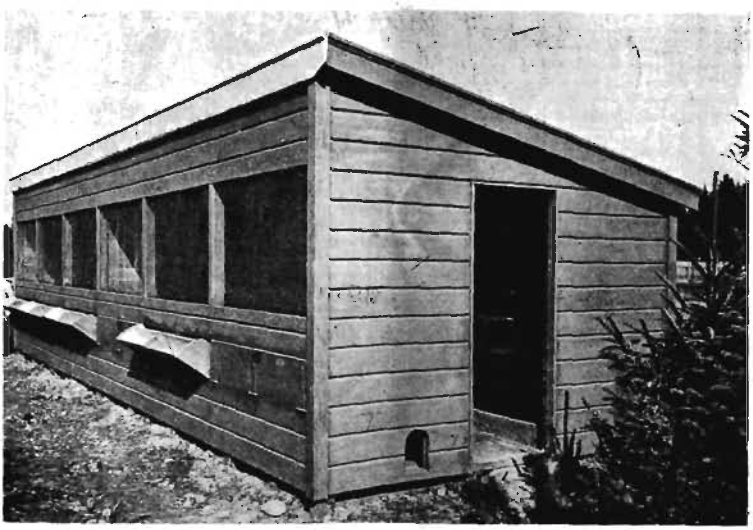


FIG. 5. WINTER HOUSE, SHOWING METHOD OF FEEDING FROM THE OUTSIDE.

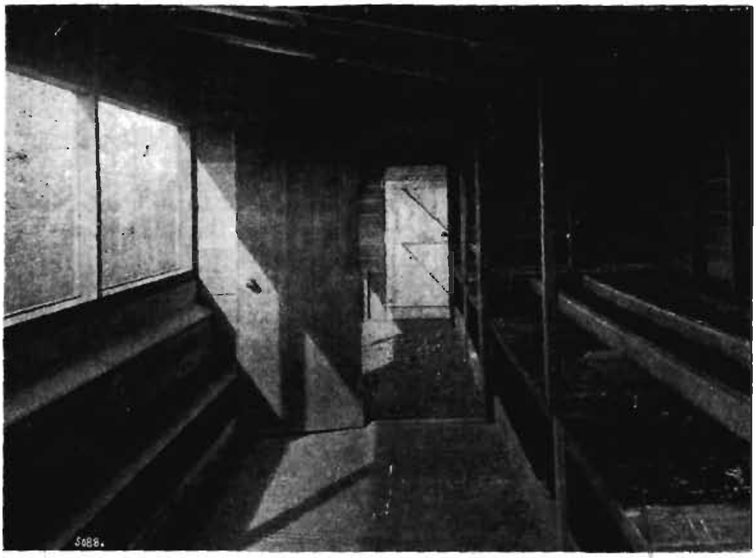


Fig. 6. Interior View of Fig. 5.

Fig. 6 is an interior view of the same house. As will be seen, the nests are constructed on a continuous plan, each being 12 in. wide by 14 in. deep and 18 in. high. They are boarded well on the top, as the feeding-trough is placed above the nests, on top of which the birds have to stand to reach their food. The perches are as previously described.

CONDITION OF THE FRUIT CROPS.

Appended are official telegraphic reports received by the Division of Orchards, Gardens, and Apiaries concerning the condition of the fruit crops as at the 31st January, 1911 :—

Auckland North.—Peaches heavy; plums light; apples and pears below average.

Auckland South.—Pears lighter than usual, otherwise crops good.

Hawke's Bay and Wellington East.—Wairarapa district, light crops all varieties. Hastings flats, all fruit destroyed by October frost; garden produce fairly good. Elsewhere apples and pears moderate to good; plums and apricots scarce; peaches and nectarines below average.

Taranaki and Wellington West.—Southern portion, apples good; northern portion, apples fair; pears moderate; plums (Japanese) very heavy; plums (English) light; peaches light to moderate.

Nelson.—Peaches, nectarines, apricots, plums, heavy; apples and pears good; raspberries poor.

Marlborough and Sounds.—Apples, pears, peaches, good average crop; plums light; apricots, heavy crops, but all done.

Canterbury and Westland.—Apples, pears, plums, and strawberries, light crop; apricots and peaches, good crop; cherries and other small fruits, fair crops: tomatoes good.

Otago and Southland.—Apples and plums light; apricots, pears, and

SOME OF THE COMMON AILMENTS IN FOALS.

BY H. C. WILKIE, F.R.C.V.S.

THE ailments of foals are naturally of great interest to all breeders of horses on account of their economic importance and of the difficulties which are generally supposed to surround their treatment.

The anatomy of the foal is sufficiently distinct in important features from that of the adult horse to require a special consideration, while the physiological actions of important organs in early life require some study before even simple ailments can be properly understood.

I purpose, however, dealing only with a few of the more common ailments of foals from a purely practical standpoint in order to endeavour to smooth away some of the difficulties with which all breeders of horses are sooner or later faced.

All the conditions here mentioned are of common occurrence, and are capable of directly or indirectly causing death. Most of them admit of successful treatment with very simple remedies, such as can be procured almost anywhere, and, although it would be too much to hope that by reading this the same success can be obtained as by the personal services of an experienced veterinary practitioner, yet the lives of many valuable foals might be saved, which in a great many parts of the Dominion, far from the reach of professional aid, are now lost.

PERSISTENT URACHUS.

This is a dribbling of the urine from the navel, and is due to the remaining open after birth of a tube connected with the bladder, called the *urachus.*

Before birth the urine trickles drop by drop from the kidneys, through the bladder, along the urachus, and flows into a membranous bag—the middle of the three envelopes of the *fœtus.* After birth this tube normally closes, the bladder retracts into its place in the cavity of the pelvis, and the urine has to find its way through what is then its proper channel—the *urethra.*

Where the urachus does not close, the urine continues to dribble through, and the longer this is allowed to continue the less likely is the tube to close spontaneously. In a few cases, and especially, I may say, in filly foals, this dribbling does spontaneously cease a few days after birth. Where it persists, it interferes very materially with the health of the foal and affords an easy point of entrance for destructive organisms, notably those which cause joint-evil—a disease to be described hereafter.

Treatment.

It is necessary, first of all, to ascertain if the natural channel for the passage of the urine, *the urethra*, is open, because if, as happens sometimes, this is blocked up, or there is any malformation such as an imperforate prepuce, this defect must be remedied before the passage through the navel is closed. Having become satisfied on this most important point, the navel-opening must be closed and the lumen of the tube obliterated.

Several different methods of doing this have been recommended at different times. The one I prefer and have found to be most successful is to take a large pin, such as a blanket-pin, and drive this through the tube, which is easily seen when the foal is lying on its back. The pin should be pushed exactly through the middle of the tube crosswise until half the pin is visible on the opposite side. A strong piece of *carbolised catgut* is now put round the part between the pin and the belly-wall, and, after being pulled tight, is tied very firmly. I usually use two half-hitches for this purpose. This is a very simple procedure and a very effective one. One can see the foal improve in condition almost hourly after it is done.

It sometimes happens, though seldom, that the urachus is broken off level with the abdominal wall and cannot be secured in the way described. These cases require special manipulation, for which professional aid is required.

CONSTIPATION.

This is a common trouble with foals, especially very young ones.

The contents of the rectum after birth, called the "meconium," should be expelled very soon after birth, but where it is retained, measures should be immediately adopted for its removal. *The meconium* of foals is naturally somewhat stiff in consistence, but when it comes away it is normally followed by much softer fæces. Retention of the meconium in foals is most frequently seen in those whose dams have been fed on dry food during pregnancy. If the bowels do not operate within two or three hours after birth it becomes necessary to adopt measures for emptying the rectum.

Treatment.

With a well-oiled finger as much of the hardened meconium as possible should be removed, and afterwards an *enema* of soapy water about three-quarters of a pint in quantity should be injected into the rectum. This is best done with a brass syringe, made for the purpose with a long well-rounded nozzle, but in an emergency it can be satisfactorily effected by passing a piece of ordinary half-inch rubber pipe into the rectum and pouring the water down it through a funnel inserted in its end. If in the course of an hour or so matters are not remedied, another enema should be given of half a pint of warm water and 3 oz. of *glycerine*. This usually has the required effect.

It is best, especially in the case of very young foals, to avoid giving medicine by the mouth for the relief of constipation. In the few cases where this is really necessary *castor oil* is the most suitable for that purpose, in doses of 1 oz. to 2 oz. *Manna* used to be employed for this purpose, and is a fairly effectual and harmless agent. Its action, however, cannot be always depended upon.

It is better, however, at all times to *operate upon the bowels of the foal through its dam's milk*, and this can in most cases be done readily enough by a little careful attention. The mare should have an abundance of pure water to drink, and she should be fed only on sloppy food such as bran-mashes and boiled roots. For medicine which will act upon the foal through the milk, the mare should re[illegible] *[illegible]te of soda.* Some mares will drink this in [illegible] s necessary to administer it, dissolved *in* w[illegible]

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IMPERFORATE ANUS.

There are various forms of imperforate anus seen in foals, most of which can be remedied by treatment.

The simplest form occurs where the anus is covered by a membrane or by skin, and the bowel beneath is normal. This condition is remedied by simply incising the skin or membrane by two cuts in the form of a cross. Very little after-attention is necessary beyond water dressings and the use of an antiseptic.

Another form which I have seen several times is where the middle of the rectum is divided by a membrane which stretches across it and prevents the fæces getting through. This condition too is to be remedied by a simple incision.

Still another variety of imperforation exists where the rectum is divided into two, each end being completely closed and separate. Such a malformation is far more serious than the others, but by a special operation a communication is made between the two parts of the rectum.

Cases of imperforate anus in foals are by no means very rare, and should always be looked for in any serious obstruction of the bowels immediately after birth.

INDIGESTION.

This is a common disorder of young foals which frequently leads to serious consequences. Its cause may be looked for in any change in the character of the mare's milk, which renders it less easy of digestion. Perhaps the commonest cause is a large supply of over-rich milk, but it may also arise from the directly opposite condition—that of an extreme poorness of quality. A frequent cause of indigestion and diarrhœa in foals is found in the alterations which take place in the mare's milk when she is put to work during the time she is suckling a foal.

Symptoms.

The foal shows considerable dulness and uneasiness, loss of the desire to suck, eructations of wind from the stomach, vomiting of milk through the nostrils, yawning, breath has a sour odour, tongue coated and white or yellowish white, windy swelling of the abdomen, diarrhœa, and abdominal pain or colic which is oftentimes very severe.

In mild cases of indigestion in foals where there is no more than a little windy swelling and an occasional vomiting of milk through the nostrils it is not unusual to find that the habit of eating the mare's dung has been acquired. This bad habit is most often seen in foals which are on too bare a pasture, or are too much shut up in a loose-box. It causes a very obstinate form of diarrhœa, and must be treated with change of pasture or more freedom if circumstances demand it, in addition to the medicinal treatment recommended. A very old-fashioned way to prevent a foal eating dung is to place a loose necklace of osiers round its neck. As soon as the head goes down, the necklace falls on to the ears and the head goes up with a start. This manœuvre is very successful for a day or two, but after that the foal gets used to it. However, by that time the cause should have been removed.

Treatment.

Prevention of this disorder is based on an examination and avoidance of all the conditions which we know cause it. If a mare has a *great flush of*

milk it is necessary to draw most of it off until this can be remedied by more scanty and dry feed. The foal will always be able to get as much milk as it really needs. If the mare is in a *very low condition* and the cause of indigestion is the poor quality of the milk, which probably contains some deleterious matters and is *deficient in fat*, the remedy for this is obvious. If the mare is *being worked while suckling* the foal, and the cause of indigestion is evidently the *acid changes* in the milk while the mare is heated and the milk is retained in the udder, the udder should be emptied when the mare comes in, and plenty of fresh milk will be formed when the foal wants it. The conditions caused by working mares suckling foals are not so common in this Dominion as in the older countries, but it is within my knowledge that they do occur here.

With regard to curative measures, where there is considerable diarrhœa and the foal is not otherwise very ill, a simple and very effective remedy consists in milking the mare out frequently, say, three or four times a day, putting her on a diet of hay, dry bran, and chaff, and giving her one or two doses of *carbonate of soda*, 1 oz. each time. This I have seen effectual time after time. In any but the newly born, this treatment may be supplemented by giving the foal a dose of carbonate of soda.

In cases of colic in foals, which occur at all ages, treatment has to be somewhat circumspect. *Colic in young foals* is often very severe, and in the absence of judicious treatment it frequently ends in death. These cases are originally caused by the presence of *undigested* and irritating matters in the intestines, and in cases where considerable fermentative action takes place there is extensive *abdominal distension*.

The removal of the irritating matter in the intestines may be hastened by giving *castor oil* and *enemas* of warm water and *glycerine* at frequent intervals.

The griping pains should not be dealt with in young foals by powerful sedatives such as *chlorodyne*, *opium*, *aconite*, &c., because this kind of treatment undoubtedly kills a good many foals which might otherwise recover.

The pain may usually be got under control by the constant application of *hot-salt bags*. These are readily made out of any linen bags, and they are sewn in crossing diagonal lines in order to hold the salt in small diamond-shaped pockets and prevent it falling all to one place. Two such bags are necessary. One should be put in an oven, while the other is firmly fastened round the foal's body and covered with a piece of mackintosh. As the heat diminishes the bags are changed. With regard to medicine, as I before said, this must be used with great circumspection, and *powerful sedatives* altogether avoided.

A homely and very good mixture for a griped foal is a little *carbonate of soda* and the ordinary *peppermint cordial* which can be obtained anywhere and which seems to suit the foal's stomach exceedingly well.

In some of these cases *stimulants* are necessary, and of these sweet wines are the most suitable. Spirits I have not found so successful as slightly diluted *port*, which a foal will suck out of a bottle after he has once tasted it. Spirits can only be administered at any time by main force, and a considerable amount of nausea is always exhibited afterwards.

Joint-evil or Navel-ill.

This disorder consists of an *infection of the system* by *pus-producing microbes* which obtain entrance through the unhealed umbilical cord or

navel-string. Cases in which the *urachus is pervious* as previously described are specially liable to this infection.

The disease is characterized by an *inflammation of the joints*, which usually manifests itself within two or three weeks of birth, but in some cases is longer delayed. It varies from what may be termed a mild case, where perhaps only one joint is swollen and painful, to a more advanced or acute infection, where there is a decided rise of temperature, a purulent nasal discharge, pus-formation in the joints, subcutaneous abscesses in different parts, diarrhœa, and a rapidly fatal termination. The variations between these two extremes are numerous, but the most commonly seen cases of joint-evil are slow in their onset and their course.

Cause.

The predisposing cause of joint-evil or navel-ill is, as previously stated, an open urachus or an unhealed navel-string, and the *exciting cause* is the admission to the system of pus-producing organisms, which are constantly present in yards, stables, and on dirty pastures, which, if bare, afford an easy contact of the soil with the point of infection in the foal.

Treatment.

This painful disease does not admit of successful treatment in any but the mildest of cases.

The joints most commonly affected are the *hocks and stifles*, although any joints may be so. Where the inflammation of the joints has not reached the stage of pus-production and the foal has a vigorous constitution there is some hope of recovery.

The mare should be *taken care of* and *well fed*, and should not have too large a paddock to roam about in. *Exercise* for a foal in this condition aggravates matters very considerably.

In all cases a careful examination of the foal's navel should be made, and if this is *unhealed* and discharging pus it should be thoroughly cleansed and fomented with warm water and kept covered with an antiseptic pad held in its place over the navel with a bandage until the part is healed. If the *urachus is open* this must be closed as previously recommended.

In many cases of joint-evil, by the time they are noticed the *navel is healed* over, and in such cases I have often found a considerable *abscess* inside the abdomen in that portion of the *urachus* which lies upon its floor, and in some cases a considerable collection of pus in the *umbilical vien* about an inch from the navel as it passes along the floor of the abdomen on its way to the liver. Such cases as these can, of course, only be handled by the veterinary surgeon.

Prevention.

The prevention of this disease consists in using an antiseptic to the umbilical cord, and properly securing it with carbolized catgut or some other suitable ligature.

It is essential that foals should not be kept about dirty yards or stables, and that mares and foals should run on clean pastures where there is a good growth of grass, and *should never be put on bare ones.*

HERNIAS OR RUPTURES IN FOALS.

The two commonest ruptures in foals are *umbilical or navel* hernia and *scrotal* hernia. The first is a very common form of rupture in Otago, and, although I am not in practice, I have operated on over twenty of these cases during the last twelve months at the special request of farmers who could not obtain the services of a veterinary surgeon otherwise. I therefore have some reason to infer that there must be a considerable number of ruptured foals born in this province.

The best age at which to operate is from nine to eighteen months old. Many cases of small navel ruptures *spontaneously reduce*, but if they persist and show no signs of diminution in size by the time the foal is *nine months old* the sooner they are operated upon after that the better. The practice in England is to perform these operations after weaning-time and before the winter sets in.

Umbilical hernia in foals consists of an opening in the abdominal wall in the vicinity of the navel through which a portion of either bowel or omentum protrudes and makes a bag for itself between the skin and the abdominal wall. Very many of these ruptures consist of a portion of the *great omentum*, or, as it is called, the *caul-fat*, and it is a few of these cases principally which spontaneously recover. There are two methods of operating on these cases—one, which is adopted for the more extensive ruptures, consists of *opening the sac* and suturing the abdominal walls with kangaroo-tendon, after freshening the edges of the opening; the other, which is adopted for mild cases, consists in *taking up the sac* with strong steel pins or skewers and a stout ligature. These remain in position usually from ten to twelve days, and after that the bowel will not come down again. Both of these operations may be said to be practically uniformly successful.

Scrotal hernia in foals is not so common as umbilical. It consists of the escape of a knuckle of bowel into the scrotum, and many of these cases recover without treatment. I have seen quite large scrotal ruptures in very young foals disappear when the animal gets to be six or eight months old. So long, however, as a scrotal hernia exists there is always a certain amount of danger from *strangulation*. On the whole it is better, except in very bad cases, to leave these ruptures until the *first year is over*, and if the hernia persists it should be remedied by operation when the animal is castrated. This is done by what is termed the "covered operation," which I need not describe here, as no one but a veterinary surgeon would be likely to attempt it. I may say that in my experience there is but little danger attached to the operation, and that it is a radical cure for the hernia.

WHITE SCOUR.

Apart from the diarrhœa induced by the presence of irritating *undigested matter* in the intestines of young foals, and that caused by the *dung-eating habit*, there is another well-known and much-dreaded form of diarrhœa called "*white scour*," an intestinal catarrh which attacks newly born foals and which is important on account of its evidently *infective nature*, the *difficulty* of its successful *treatment*, and the *heavy mortality* which attends it. It hangs about certain breeding-establishments often *for years*, and can only be eradicated by the adoption of the most vigorous measures. From my experience of the disease, I think *thoroughbreds* and *hackneys* are more liable to it than other breeds.

The disease has certain *special features* which serve to at once distinguish it from other forms of diarrhœa. It is essentially a disease of very young foals, as it occurs usually from *one day* to *a week* after birth. It is not accompanied by *pain* or *flatulency*. The evacuations are fluid, either *white*, *light yellow*, or sometimes *greyish green* in colour, and having a characteristic and highly *fœtid odour*. They are very *slimy* in consistence from the enormous quantity of *mucus* they contain. The foal loses all its strength with a *suddenness* that is sometimes astonishing, *emaciation* becomes extreme, *the eyes sink* in the orbits, and for two or three hours before death the animal lies *immovable* and apparently *unconscious*. The disease is *rapid in its course*, death taking place within *twenty-four hours* to *three days* from the first appearance of the symptoms, the shorter periods being the more common.

Brugnone, several years ago, observed an *ophthalmia* in many of these cases as a complication, particularly involving the anterior chamber of the eye. I have myself seen this condition in several cases, the eyes becoming *cloudy*, *intolerant of light*, *tears flowing freely*, and the eyeballs being *retracted into their sockets*.

This disease, so far as I am aware, is not known (at present) in New Zealand, but I mention it here because it is undoubtedly the most fatal of all the diseases to which young foals are subject. It occurs frequently as an epizootic, and it is common in Great Britain and most of the countries of Europe.

CORRESPONDENCE.

SOWING GRASS-SEED WITH WHEAT.

J. K., Flaxton, writes as follows :—

I should be glad to know what you think of sowing grass-seed with a crop of Hunter White wheat, say in the middle of April, as is sometimes done with Dun oats : or do you think it would be better to sow grass-seed by itself ? I have a paddock of heavy peat land to sow which has already grown a crop of beans.

The Director of Fields and Experimental Farms replies,—

Grass from seed sown with a gross-growing cereal, such as most varieties of the Hunter strains, is not usually a success. It must be obvious that a crop, such as wheat, which withdraws from the soil a high proportion of plant-food is far from conducive to the luxuriance of the grass that is sown with it and struggles with it for sustenance. It must be remembered that grass-seed is costly, so also it is expected to remain profitable for some years. Therefore it should be sown by itself after careful and thorough cultivation, and on land liberally supplied with the elements of plant-food.

TIME FOR CUTTING GREEN MAIZE.

F. M., Whakaronga, wishes to be informed when maize is ready to cut for feeding to cows green.

The Director of Fields and Experimental Farms states.—

The best time to cut maize for feeding green to cows is when the cob of the plant is formed, but before the grain begins to harden. It is recognized that it is impossible to utilize a large area of maize when the cutting is left to such a late period. When maize is sown for the purpose of green feed, a small area should be sown at intervals of, say, a fortnight. The area to be sown of course depends on the number of stock to be fed.

SHORN *VERSUS* UNSHORN LAMBS.

To THE EDITOR.

SIR,—

Having for many years shorn lambs at the same time as the ewes—the end of November (if possible)—I feel satisfied that is the best plan, for various reasons. It saves mustering and knocking the lambs about. If ticks are about—and there are few flocks where none are found at this season of the year—they leave the bare skin of the ewe, and infest the woolly lamb. (If lambs are not to be shorn I advocate dipping off the shears, for this reason.) Again, by early shearing, the covering is removed at the beginning of summer, when it becomes a burden, so that the shorn lamb thrives much better than when woolly, and the fleece has more time to grow before winter sets in, which is of greater importance than is generally admitted by sheep-men, and which the last experiment at Ruakura has proved.

With regard to the general utility of shearing lambs, much depends on local conditions, but I have come to the conclusion that when lambs are dropped in the end of August or September, and shearing takes place at the end of November, it is advisable to shear the lambs with the ewes for the reasons already stated.

I have been much interested in the result of your experiment*, as for many years few would admit that the method we adopted was the most payable. But there is one aspect that has been one of my leading arguments in favour of early shearing that is not touched by the Ruakura experiment—namely, the value of the wool, which is put down at one price. I suppose it was owing to the vagaries of the wool-markets that the value of the lamb's wool is set down at 7¼d., and of the hogget-wool at 11d. I would suggest (perhaps you are adopting it in the coming experiment) valuing the lamb's wool that comes off in January, and when the hoggets are shorn in October or November value the fleece on the same market basis; also, that expert value be obtained as to the difference between the shorn and the unshorn hogget-wool. In reality the wool from hoggets that have been shorn as lamb's is not hogget-wool in the eyes of the manufacturer, as the natural life, which he values, has been removed. Another reason for having the fleece valued is that buyers have been complaining of late years of the shortness in staple of New Zealand wool, which can be partly accounted for by the fact that the greater portion of the hogget-wool, especially that of the North Island, is only of about nine months' growth, whereas if the lambs were shorn at the ewe-shearing the hogget-wool would have the full twelve months' growth, and thereby be more valuable.

I hope you will accept these suggestions in the spirit in which they are offered. They may not be of any great moment in the eyes of some even most successful sheep-men, but my experience leads me to the foregoing conclusions.

I am, &c.,

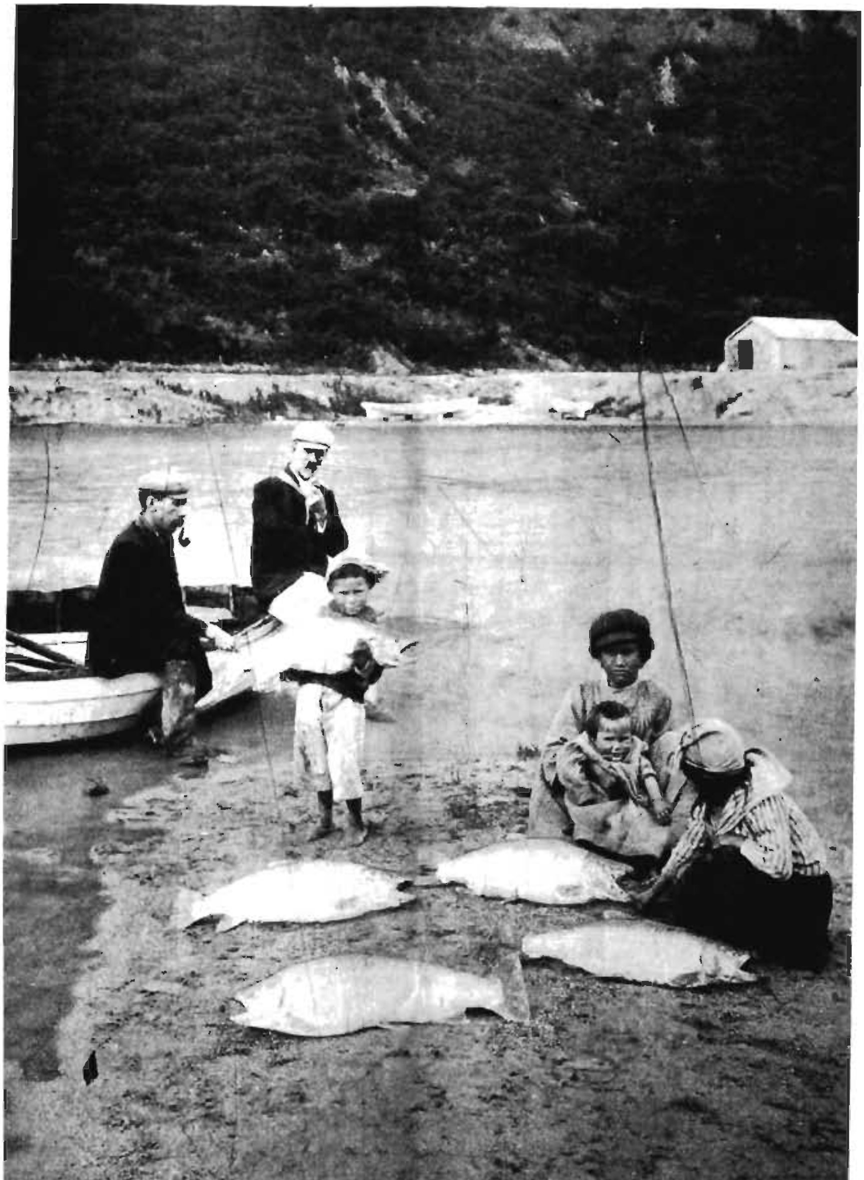
Feilding, 17th December, 1910. JOHN LINTON.

* October number of the *Journal*, page 362.

ESTIMATED AVERAGE YIELDS OF FIELD CROPS AS AT 31ST JANUARY, 1911.

District.	Wheat.	Oats.	Barley.	Maize.	Peas.	Rye-grass.	Cocks-foot.	Red Clover.	Potatoes.	Turnips.	Mangolds.
	Bushels per Acre.					Pounds per Acre.			Tons per Acre.		
Auckland	31·74	36·82	32·16	55·42	30·00	492	344	..	6·45	19·50	21·90
Hawke's Bay	28·00	34·00	33·00	45·00	25·00	420	137	..	8·00	17·00	31·00
Taranaki and Wellington	29·00	37·00	45·00	..	..	420	..	..	7·00	..	..
Nelson and Marlborough	34·70	37·00	22·60	..	29·50	417	205	198	6·80	18·00	20·60
Canterbury	27·40	34·60	31·40	..	32·00	398	95	132	7·30	13·65	26·60
Otago	24·53	37·63	18·31	..	33·60	552	242	200	5·45	15·10	14·00
Southland	33·00	41·00	31·00	..	15·00	528	219	..	7·00	17·00	22·00
Averages for the Dominion	27·12	36·95	27·22	52·13	31·14	488	126	147	6·65	15·56	21·60
Dominion averages for ten years, 1900–1 to 1909–10	31·39	39·44	34·5	50·34	32·01	505·2	184·05	..	5·84	..	..

NOTE.—In calculating the averages, a deduction has been made of the acreage fed off during the late dry weather in North Otago and Canterbury. Full allowance has also been made for the damage to the cocksfoot crop in Canterbury.



TROUT-FISHING AT ROTORUA: A FISHING SCENE.

[Iles, photo., Rotorua.

HEMP AND TOW GRADING RETURNS.

JANUARY, 1911.

Hemp.—The total number of bales of hemp graded by the Department during January was 9,899, as against 12,296 for the corresponding month of the previous year—a decrease of 2,397 bales.

For the twelve months ended 31st January, 1911, the number of bales graded was 124,417, as against 93,035 for the previous twelve months—an increase of 31,382 bales.

Tow.—During the month 3,256 bales were dealt with, as against 4,184 for the previous month—a decrease of 928 bales.

HEMP AND TOW GRADED THROUGHOUT THE DOMINION DURING JANUARY, 1911.

Hemp.

Port.	Superior.	Fine.	Good Fair.	Fair.	Common.	Rejected.	Condemned.	Total.
	Bales.	Bales	Bales.	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	..	5	760	848	88	..	..	1,701
Napier ..	..	..	238	..	..	..	..	238
Foxton ..	..	85	2,979	218	8	21	..	3,311
Wellington ..	..	97	1,891	1,508	33	9	..	3,538
Blenheim ..	..	114	13	..	..	..	..	127
Picton ..	..	41	134	..	..	..	..	175
Lyttelton ..	..	75	..	..	..	..	..	75
Dunedin ..	..	..	209	78	..	..	..	287
Bluff ..	..	..	51	392	4	..	..	447
Totals ..	..	417	6,275	3,044	133	30	..	9,899
Percentages of total	..	4·21	63·39	30·75	1·35	0·3	..	100

Tow.

Port.	First Grade.	Second Grade.	Third Grade.	Condemned.	Total.
	Bales.	Bales.	Bales.	Bales.	Bales.
Auckland ..	..	374	195	103	672
Napier	60	..	..	..	60
Foxton	59	554	136	..	749
Wellington ..	362	664	132	21	1,179
Blenheim ..	86	..	..	..	86
Picton	83	..	92	..	175
Lyttelton ..	95	..	..	..	95
Dunedin ..	..	22	..	..	22
Bluff	..	33	150	35	218
Totals ..	745	1,647	705	159	3,256

COMPILED FROM MANIFESTS OF VESSELS SAILED DURING RESPECTIVE MONTHS OF THE CURRENT AND PRECEDING SEASONS.

Month.		Mutton, Carcases.	Lamb, Carcases.	Beef, Quarters.	Butter, Boxes.	Cheese. Crates.	Wool, Bales.	Wheat, Sacks.	Oats, Sacks.	Rabbits, Crates.	Hemp, Bales.	Tow, Bales.	Kauri-gum, Cases.	Sundry.
October,	1910	49,010	800	10,531	60,014	9,159	3,189	94,815	23,330	36,947	3,632	1,232	3,089	56 carcases pork.
"	1909	103,746	49,600	4,049	57,221	13,716	3,995	..	41,079	24,847	1,105	631	7,882	..
November,	1910	62,926	29,877	5,554	105,759	27,749	55,551	76,594	331	28,646	6,850	2,300	4,339	911 carcases pork.
"	1909	56,467	40,973	11,073	99,951	33,019	49,480	..	21,955	26,448	4,151	734	4,383	..
December,	1910	82,405	157,172	13,155	182,051	67,162	59,080	..	..	9.716	4,524	109	5,363	686 carcases pork.
"	1909	90,245	86,345	25,199	164,314	68,867	72,056	..	2,613	2,128	7,389	1,618	8,742	..
January,	1911	175,337	287,120	13,568	90,405	46,375	127,199	..	16	399	15,234	3,302	7,094	590 carcases pork.
"	1910	86,491	252,193	22,527	87,934	39,717	122,399	2,391	15,839	1,634	11,305	4,704	5,682	..
February,	1910	196,093	414,408	23,798	97,766	62,192	102,182	4,724	8,600	..	4,223	2,314	4,827	1,719 carcases pork.
"	1909	237,681	300,018	24,214	81,232	38,410	66,494	439	9,921	..	4,383	985	7,982	..
March,	1910	222,058	413,179	22,134	77,319	42,029	64,266	2,899	3,636	..	9,152	2,490	2,959	798 carcases pork.
"	1909	215,793	406,982	22,031	43,235	31,271	85,994	5,421	16,858	..	4,955	1,447	8,107	..
April,	1910	209,120	559,166	29,355	46,524	44,032	32,920	21,855	1,934	12	10,179	2,951	4,250	627 carcases pork.
"	1909	281,412	525,211	19,511	21,783	29,164	27,468	15,051	16,975	..	5,910	786	580	..
May,	1910	310,196	622,232	38,276	9,588	28,384	25,123	81,052	..	3,010	10,017	2,346	3,150	1,293 carcases pork.
"	1909	261,886	675,070	39,961	4,307	17,508	39,259	135,346	139,297	3,500	6,171	972	2,473	..
June,	1910	299,596	555,777	60,286	485	17,963	21,260	13,707	..	8,988	6,180	2,684	7,104	658 carcases pork.
"	1909	108,094	302,721	29,029	6	12,406	12,157	88,974	223,563	3,500	1,768	790	3,762	..
July,	1910	249,906	334,753	71,160	..	595	12,816	20,604	1,106	8,649	6,695	1,437	8,272	2,448 carcases pork.
"	1909	164,437	231,053	31,929	1,479	3,650	22,471	77,909	170,701	5,473	4,429	633	10,260	..
August,	1910	94,468	97,899	16,440	634	..	5,381	33,970	273	22,629	1,378	720	6,793	362 carcases pork.
"	1909	63,219	117,316	41,029	3,601	1,721	6,575	27,207	234,998	9,149	2,348	1,286	887	..
September,	1910	104,925	26,416	8,420	22,644	41	6,539	40,876	3,863	7,721	2,680	597	1,682	255 carcases pork.
"	1909	70,815	73,827	22,272	9,886	974	6,575	1,040	62,372	40,006	1,352	484	10,325	..

THE BRITISH PRODUCE-MARKET.

High Commissioner's Cabled Reports.

The following are cabled market reports received by the Department from the High Commissioner, London, during the monthly period prior to publication of the *Journal*. Unless otherwise specified, the prices quoted are average market prices on spot at date of message. Grain is *ex* granary on spot.

14th January, 1911.

Mutton.—The market is quiet, but holders are firm. The supply of Canterbury is practically exhausted. Canterbury 4⅝d. (nominal), North Island 4⅛d., per lb.

Lamb.—The market shows signs of weakness. New season's Canterbury 6d., other New Zealand 5¾d., per lb.

Beef.—The market is quiet, with an improved demand. New Zealand hind quarters 3½d., fore quarters 2⅞d., per lb.

Butter.—The market is firm, and has advanced on account of speculative buying. New Zealand choicest 110s., Australian 104s., Danish 116s., Argentine 106s., per cwt.

Cheese.—The market is firm with a hardening tendency. The demand is getting better, and prospects are favourable. New Zealand finest white 57s., coloured 58s. 6d., per cwt.

Hemp.—The market is dull, and likely to continue so. New Zealand good fair £20 5s., fair £19 15s., Manila fair current £19, per ton. Forward-shipment prices about the same. The output from Manila for the week was 19,000 bales.

Wool.—The market is a shade weaker; buyers are holding back. Bradford tops: 36's (low crossbred) 1s. 1d., 40's (low crossbred) 1s. 1¾d., 44's (medium crossbred) 1s. 2½d., 50's (half-bred) 1s. 6½d., 56's (quarter-bred) 1s. 9½d., 60's (merino) 2s. 1½d.

17th January, 1911.

The first series of colonial wool-sales for 1911 have commenced with a large attendance of buyers. Competition is confined chiefly to Home manufacturers, whose trade is good. America and the Continent are holding off to ascertain market values. A large supply of crossbred wool is being offered. 58,800 bales of New Zealand wool are catalogued. Compared with closing-prices of the previous sales fine wools are ½d., and medium and coarse ¾d., lower.

21st January, 1911.

Mutton.—The market is steady. Stocks of New Zealand are small, but high prices are restricting business in the market. The supply of Australian and River Plate meets the demand, and they are selling freely. Canterbury cannot be quoted. North Island 4⅛d., Australian 3⅛d., River Plate 3⅜d., per lb.

Lamb.—There is a dull sale for all lamb, and the market has declined. Canterbury 5⅞d., other New Zealand 5⅝d., per lb.

Beef.—The market is firm, and stock on hand small. There is a good inquiry, especially for fores. New Zealand hind quarters 3½d., fore quarters 3d., per lb.

Butter.—The market was firm, with more inquiry at higher prices, about the beginning of the week, but closed rather quiet. New Zealand choicest 110s., occasionally 111s.; Australian 105s., Danish 116s., Siberian 103s., per cwt. The "Arawa" shipment arrived in good condition.

Cheese.—The market is firmer. The "Arawa" shipment arrived in good condition, and met with a brisk demand. Coloured 59s., white 57s. 6d., per cwt.

Wool.—The market is stronger.

Cocksfoot-seed.—The market is quiet but firm. New crop 19 lb. seed was offered at 80s. per cwt. There are no buyers.

Eggs.—Cold-stored Italian 10s. 6d. to 12s., Austrian 8s. 3d. to 10s., Danish 11s. 9d. to 13s. 6d., per 120.

Hemp.—The market is quiet, with a small business doing at about last quotations. The output from Manila for the week was 30,000 bales.

Kauri-gum.—The market is quiet, but holders are firm. A small business doing, and prices are weak in the market. Quotations are nominal. Ordinary to fair three-

quarters scraped £8 2s. 6d., fair half-scraped 97s. 6d., brown fair half to three-quarters scraped 80s., brown pickings common to good 45s., bush fair to good pale and amber scraped £8, per cwt. Stock, 337 tons.

28th January, 1911.

Mutton.—The market is dull. Trade for all classes has been very slow, and prices are barely maintained. North Island 4d. per lb.

Lamb.—The market is quiet, as a result of heavy arrivals. Canterbury 5¾d., other New Zealand 5½d., Argentine 4¼d., per lb.

Beef.—The market is firm. Stocks of New Zealand on hand are light. New Zealand hind quarters 3⅝d., fore quarters 3⅛d., per lb.

Butter.—The market is very unsettled. Buyers are holding back expecting prices to go lower. There is a large supply on hand. New Zealand choicest 105s., Australian 101s., Danish 115s., Siberian 100s., per cwt.

Cheese.—The market is firm, and there is a good demand. New Zealand coloured 60s., white 58s., per cwt.

Cocksfoot-seed.—The market is quiet, and buyers are not keen to do business. New Zealand bright clean 17 lb. seed 73s. per cwt.

Poultry.—The market is unchanged. Chickens: American 8d. to 9d., Russian 7½d. to 8½d., per lb. Ducklings, 6d. to 7d. per lb.

Wool.—The market is firmer, and confidence is again returning.

Hemp.—The market is flat, and there is scarcely any demand. Prospects are unfavourable. New Zealand good fair £19 10s., fair £19, Manila fair current £18 10s., per ton. Forward shipment: Good fair £19 10s., fair £19 5s., Manila £19. The output from Manila for the week was 28,000 bales.

4th February, 1911.

Mutton.—The market is quiet, but holders are firm. Canterbury 4¼d., North Island 4d., Australian 3¼d., River Plate 3⅜d., per lb.

Lamb.—The market is weak and inactive. Canterbury 5¾d., other New Zealand 5½d. per lb.

Beef.—The market is firm, owing to reduced supplies. New Zealand hind quarters 3¾d., fore quarters 3¼d., per lb.

Butter.—The market is quiet but firm at present quotations. New Zealand choicest 105s., Australian 102s., Danish 115s., Siberian 101s., per cwt.

Cheese.—The market is quiet, but moderate business doing. New Zealand white 57s. 6d., coloured 60s., per cwt.

Hemp.—The market has declined further, and there is little demand. New Zealand good fair £19 5s., fair £18 10s., Manila fair current, £18 5s., per ton. Forward shipment: good fair £19 5s., fair £19, Manila £18 10s., per ton. The output from Manila for the week was 26,000 bales.

Cocksfoot-seed.—The market is firm, but the demand only moderate. New Zealand bright clean 17 lb. seed 73s. per cwt.

Eggs.—The market is firmer on account of cold weather. Italian 9s. 3d. to 12s. 3d., Danish 10s. 6d. to 13s. 6d., Austrian 9s. 7d. to 10s., Russian 6s. 6d. to 9s., per 120.

Frozen Poultry.—There is a large supply and a moderate demand. Chickens—American 8d. to 9d., Russian 7½d. to 8½d., ducklings, 6d. to 7d., turkeys, 7d., per lb.

Wheat.—The market is quiet, and may go lower. New Zealand long-berried, per quarter of 496 lb. 34s., short-berried 33s.

Oats.—There is a small supply and a limited demand. New Zealand short oats, per quarter of 384 lb., 18s. 6d.; New Zealand Danish, per quarter of 320 lb., 16s. 9d.

Beans.—There is a good demand for all descriptions on account of the small supply. New Zealand f.a.q. (old crop), per 504 lb., 35s.

Peas.—The market is quiet, but holders are firm. New Zealand partridge, per 504 lb., 46s.

Wool.—For fine wools the market is firm. For medium and coarse crossbreds the market is rather quiet.

7th February, 1911.

The wool-sales have closed. The market has been irregular, but closed firm at present quotations. British manufacturers are busy, and trade is good on the Continent. 4,500 bales of New Zealand wool are held over. Estimated value of greasy wools are as follows: Superior merino, 11½d. to 1s. 1d., medium merino, 9½d. to 11d., inferior merino, 8d. to 9d., fine crossbred, 11d. to 1s. 2d., medium crossbred, 9d. to 10½d., coarse crossbred, 8d. to 10d., per lb.

SHIPMENTS TO UNITED KINGDOM FROM ARGENTINA.

THE Department has received the following cablegram from Buenos Aires, dated 9th February, 1911 :—

The following shipments of produce were despatched from the Argentine to United Kingdom ports during January, 1911 (compared with figures for January, 1910) :—

	1910.	1911.
Frozen beef (quarters)	147,684	107,185
Chilled beef (quarters)	176,842	86,297
Frozen mutton (carcases)	317,092	133,661
,, lamb (carcases)	66,937	22,243
Butter (cwt.)	720	16,406

THE MARKET FOR HONEY.

IN a report, dated 23rd November, 1910, the Produce Commissioner in London states that the demand for finest-quality honey has been good for a length of time past on the British market. Shipments from New Zealand, besides being inconsiderable, have not been made with the regularity essential to the establishment of a steady trade. Consequently prices realized, while fairly good, have not been so satisfactory as they would have been had traders been assured of a regular and steadily increasing supply. The class of honey most in demand in Britain is one of fine flavour, bright orange or yellow colour, and smooth consistency. For New Zealand honey of this description up to 40s. per hundredweight had been the price lately ruling. This is higher than prices for Jamaican, and equal or slightly in excess of those for Californian. Inferior quality is only saleable at much lower prices, as it comes into direct competition with large supplies of secondary honey from other countries, for which prices were then from 25s. to 30s. per hundredweight. Several lots of inferior-quality New Zealand honey had been on the market lately, some parcels not being of good colour, while others had a strong and unattractive flavour. New Zealand consignments had also come under notice in which the honey was packed in 2 lb. tins. Consumers in England are strongly adverse to purchasing honey in tins. Honey is invariably retailed in attractive glass bottles or jars. As it would not pay to ship honey so made up, it is necessary that it be shipped in bulk, and packed for sale to the retail trade in glass bottles after being landed. The honey should be run—not sent in the comb. It should be packed in 56 lb. tins, two in a case, with a neat, clean finish. It would also be well to prominently label or brand the cases "New Zealand." The highest price for honey is generally obtained in the winter, when the demand is greatest. The English honey crop in the last season was an unusually short one, and supplies were short. Reports from California and Jamaica, the two chief sources of outside supply, indicated that a shortage was also being experienced there. The prospects, therefore, were for high ruling prices for some time, and shipments made from New Zealand early in the coming season should find a ready sale. For the establishment of a satisfactory trade, however, regularity of supply and high standard of quality are essential. Nearly all the large grocery stores, Italian-warehousemen, co-operative wholesale societies, &c., are buyers of honey. Dealers who buy to resell to firms such as these are also in the market, while brokers in whose hands shipments are frequently placed for sale are occasionally purchasers. There are regularly fortnightly sales of honey in London, but for the finer qualities it is usually found that better prices are obtained by private treaty than by auction.

BEESWAX.

THE Produce Commissioner reports, under date London, 23rd November, that beeswax was commanding a ready sale at high prices, pale being then worth about £7 10s. per hundredweight, while yellow or brown fetched £6 10s. to £7. Beeswax should be shipped in small cakes of about 5 lb. or 6 lb. weight, this being preferred to larger sizes. It should be properly graded, and packed in neat cases containing about 1 cwt. each. The report states that beeswax is preferred by buyers in its natural state. If refined, there is often a suspicion that it has been adulterated.

Instruction in Poultry-keeping.

Conditions under which Students are received at the Government Poultry-stations.

The poultry-stations are at Ruakura, near Auckland; Moumahaki, near Waverley; Burnham, near Christchurch; and Milton, near Dunedin.

A limited number of students are received and instructed under the following conditions:—

(1.) They must pay their own travelling-expenses.

(2.) At Moumahaki board and sleeping-accommodation are available at the Government Experimental Farm, at about 12s. per week; students must, however, supply their own blankets. At Ruakura, Burnham, and Milton no Government accommodation is available, but board and lodging may be obtained privately within a convenient distance.

(3.) Students are expected to stay at least six weeks at the poultry-station.

(4.) They receive no wages, but must do such work in connection with poultry as the manager of the station may require of them.

It should be borne in mind that a few weeks spent on a Government poultry-farm will not make a student capable of managing a large plant, but it will be the means of enabling him to avoid many of the mistakes made by beginners.

PRACTICAL ADVICE.

The Department's Poultry Instructor (Headquarters, Wellington) is always prepared to visit those who are in the business, to give practical advice and instruction in all its branches, and also welcomes interviews at the offices with those who have not already started. In cases where attendance is not necessary or convenient, inquiries will be answered by letter. Intending poultry-keepers should avail themselves of the advantages offered, and thus avoid many of the mistakes frequently made by beginners.

ITALIAN BEES AND QUEENS OBTAINABLE AT THE GOVERNMENT APIARY, WAERENGA.

A QUEEN-REARING apiary is established at the Department's Waerenga Experimental Farm, Auckland, from which Italian queens and bees, bred and reared under the very best conditions, may be purchased. The Waerenga Apiary is an ideal site for the purpose, being some five or six miles from the nearest natural habitat for bees, and the whole property is entirely free from disease.

PRICES.

ITALIAN QUEENS.	s.	d.
Tested for purity of mating, each	10	0
Tested and specially selected, each	15	0
Tested and specially selected for queen-breeding, each ..	25	0

(No untested queens will be sold.)

COLONIES OF BEES WITHOUT QUEENS.	s.	d.
Two-frame nucleus colony, each	10	0
Three-frame nucleus colony, each	12	6
Four-frame nucleus colony, each	15	0
Full colony, on ten frames	30	0

To the above prices must be added the price of the queen required.

Orders for two-frame colonies must be for two or more, so that they can be battened together to prevent them from being laid on their sides.

CONDITIONS OF SALE.

As a rule, queens bred during any season cannot be fully tested before about the end of November, a little earlier or later according to the season, but all orders received will be executed in rotation as rapidly as possible after the queens and bees are ready.

Colonies of bees will be sent on the regular Root-Hoffman Langstroth frames, in specially prepared well-ventilated boxes made for the purpose. Hives into which the frames and bees should be transferred on arrival had better be in readiness.

Queens will be sent free by post. The carrying-charges on colonies of bees must, however, be borne by the purchaser. In the absence of any other instructions they will be sent through a carrying company. The charges will be collected on delivery. The Department will place the bees free on the train at Wairangi.

Every care will be taken to insure safe transit, but no responsibility will be accepted after queens or bees are despatched.

Full postal and telegraphic address, and instructions, if any, should be sent with the order.

Orders must be accompanied by the proper remittance, and should be addressed to "The Manager, Waerenga Experimental Farm, per private bag, Auckland."

Cheques and money-orders should be made payable to "The Receiver, Department of Agriculture, Commerce, and Tourists," and not to any individual by name.

Cheques must have exchange added.

A leaflet containing further information may be had on application to the Department.